STANDARDIZATION AND PHARMACOLOGICAL SCREENING OF *AARADHARA PARPAM*

The dissertation Submitted by

DR.V.MAHALAKSHMI

Under the Guidance of

DR.S.VISWESWARAN, M.D(s),Ph.D

H.O.D i/c &Guide, Department of Gunapadam,

National Institute of Siddha, Chennai-47

Dissertation submitted to

THE TAMILNADU DR. MGR MEDICAL UNIVERSITY

CHENNAI-600032

In partial fulfilment of the requirements

For the award of the degree of

DOCTOR OF MEDICINE (SIDDHA)

BRANCH-II-GUNAPADAM

2016-2019

NATIONAL INSTITUTE OF SIDDHA

(The Ministry of AYUSH – Govt of India)

Chennai – 47.

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **"Standardization and Pharmacological Screening of *Aaradhara Parpam*"** is a bonafide and genuine research work carried out by me under the guidance of **Dr.S.Visweswaran M.D(s),Ph.D,** Head of the Department i/c, Department of *Gunapadam*, National Institute of Siddha, Chennai – 47 and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: **Signature of the Candidate**

Place: Chennai - 47 Dr.V.Mahalakshmi

CERTIFICATE BY THE GUIDE

This is to certify that the dissertation entitled **"Standardization and Pharmacological Screening of *Aaradhara parpam*"**is submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the requirements for the award of degree of M.D (Siddha) is the bonafide and genuine research work done by **Dr.V.Mahalakshmi** under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: **Signature of the Guide**

Place: Chennai-47 **Dr.S.Visweswaran M.D(s),Ph.D**

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **"Standardization and Pharmacological Screening of *Aaradhara parpam*"**is a bonafide work carried out by **Dr.V.Mahalakshmi** a candidate of the National Institute of Siddha, Chennai-47 in partial fulfillment of the University rules and regulations for award of M.D (Siddha) - Gunapadam during the academic year of 2019.

Signature of the HOD
Dr. S.Visweswaran, M.D(s),Ph.D

Signature of the Director
Dr.N.J.Muthukumar, M.D(s),Ph.D

ACKNOWLEDGEMENT

This dissertation is one of the milestones in the journey of my professional carrier as it is the key program in acquiring my **post graduation** degree. So I take great pleasure in thanking all the people who made this dissertation study a valuable and successful one, which I owe to treasure it.

- I feel enormous wonder and colossal gratitude in my heart of hearts to **GOD** Almighty for making this dissertation have its present form.
- I express my sincere thanks to the **Vice-Chancellor**, The Tamilnadu Dr.MGR medical University, Chennai-32.
- I express my profound sense of gratitude to **Prof. Dr.N.J.Muthukumar, M.D(s), Ph.D,** Director, National Institute of Siddha, Chennai-47.
- I express my sincere thanks to **Dr.S.Visweswaran, M.D(s),Ph.D.,** Associate professor, Head of the Department of Gunapadam (i/c)., & Guide, National Institute of Siddha, Chennai-47, for his valuable suggestions and guidance in this dissertation work.
- I express my sincere thanks to **Dr.S.Sivakkumar, M.D(s),Ph.D,** Associate professor, Gunapadam department, NIS, Chennai-47, for his suggestions.
- I express my sincere thanks to **Dr.A.Mariappan, M.D.(s)., Ph.D,** Lecturer, Gunapadam department, NIS,Chennai-47, for his suggestions.
- I express my sincere thanks to **Dr.V.Suba, M.Pharm, Ph.D.,** Assistant Professor in Pharmacology, NIS, and Chennai-47.
- I express my sincere thanks to **Chairman and Members of Institutional Animal Ethical Committee (IAEC),** National Institute of Siddha, Chennai-47, for theirvaluable guidance.
- I express my sincere thanks to **Dr.D.Aravind M.D(s) M.Sc.,** Assistant Professor, Medicinal Botany, NIS, and Chennai-47.
- I express my sincere thanks to **Mr.M.Subramanian**, **M.Sc,.**(statistics) Senior Research Officer, National Institute of Siddha, Chennai-47.
- I express my grateful thanks to Central Electrochemical Research Institute, karaikkudi for my instrumental studies and The TamilnaduDr.MGR Medical University, Guindy Tamil Nadu Veterinary and Animal Sciences University, chennai, for my analytical studies.
- I wish to thank Library assistants, NIS, Chennai – 47.

- I express my gratefulness to **All My Colleagues and Juniours** for lending their helping hands whenever needed during the course of the study.
- Last but not least, I would like to pay high regards to all my family members, my Father **Mr.M.Veerapandian**, my mother **Mrs.K.Tamilarasi,** my brothers **Mr.V.Vinothkumar, Mr.V.Karthickkumar, and** my friends **Dr.K.Petchiammal, Dr.G.Manikandan, Dr.S.Aishwarya, Dr.R.Keerthana, Dr.S.Sadhika** for their sincere encouragement and inspiration throughout my research work and lifting me uphill this phase of life. I owe everything to them. Besides this, several people have knowingly and unknowingly helped me in the successful completion of this project.

1. INTRODUCTION

Siddha system of medicine is a holistic medical science which cares body and mind. Siddha system is based on truth and philosophy. This Medicine system has unique features like removal the root cause of the disease and perfect remedy for body, mind and soul.

This system was formulated and established about more than 3000 years back by the eminent powers called Siddhars and hence the name Siddha Medicine. Siddha medical system doesn't consider treatment and prevention separately. The main aim of this system is prevention of disease, as it is well said that **"Prevention is better than cure" Siddha system emphasizes not only a healthy body but a peaceful mind and pure soul. Hence, it is unique when compared to any other medical system.**

According to the Siddha system, there are five elements that exist in nature: earth, water, fire, air, and ether, all of which form the original basis of all corporeal things. It is believed that there is an intimate connection between the macrocosm(the world) of the external world and the microcosm(the human) of the corporeal being. Three of the elements—air, fire, and water—are emphasized in Siddha medicine because they are believed to form the three fundamental components that make up the human constitution. These three components—*vata*, *pitta*, and *kapha* (representing air, fire, and water, respectively)—are known as humours, and their inharmonious interaction produces various pathological states.

According to the theories of humoral pathology, all diseases are caused by the discordant mixture of *vata*, *pitta*, and *kapha*. Their proportions in the body govern a person's physical and mental disposition.

The incidence of Urolithiasis is very common in the world. In our Siddha system Urolithiasis may be compared to Kalladaippu. According to siddha literature, kalladaippu occurs due to vitiated pitham.various herbs, metals, minerals and marine products are indicated for its treatment. Siddha formulations are most often prepared with single or many herbs or herbo-mineral compounds, which may act in an agonistic, synergistic, complementary and antagonistic ways.

Kalladaippu is the most common diseases of present society due to sedentary life style and improper diet habits. A large number of people are suffering from urinary stone problem all over the globe. Kidney stones are quite common and usually affect people in

the age group between 30 and 60 years of age. They affect men more than women. Clinical features of kalladaippu are lower abdominal pain, dysuria, oliguria, burning micturition, nausea, vomiting and haematuria.

Worldwide Prevalence of kidney stone is 4-15% and the average life time risk is 15-25%. It is considered as the 3rd most common affliction of the urinary tract. The disease is described by the formation of stone in the kidney or urinary tract in large number of people[(6)].

Nearly 5-15% of population in industrialized countries are affected by this condition worldwide. The incidence has been more in developing countries including India and more predominantly affecting 30-50 years age group. Renal colic affects about 10 to 20% of men and 3 to 5% of women. In India 12% of the population is expected to have urinary stones out of which 50% may ends with kidney damage. 10.6% of men and 7.1% of women in the United States are affected by renal stone disease (National Health and Nutrition examination survey, 2012). In most of the countries renal calculi occurs due to climate, local geology with hydro mineralogy[(6)].

Increased global temperature may increase the incidence of renal calculi according to the research presented at the 103rd annual scientific meeting of the American urological association. Many studies from India shows calcium oxalate stones are very common. With its multifactorial etiology and high rate of recurrences now a days renal calculi becomes one of the medical challenging diseases.

Diet plays an important role in the development of kidney stones, especially in patients who are predisposed to this condition. A diet high in sodium, fats, meat and sugar, low in fibre, vegetable protein and unrefined carbohydrates are increase the risk of kidney stones. Oxalate is found in green beans, tomatoes, nuts, chocolates and tea which increase the risk for kidney stones.

Fluids intake and urinary output may have an effect of urinary stone disease. The average daily urinary output in stone formers is 1.6 L/d. A low fluid intake, with a subsequent low volume of urine production, produces high concentrations of stone forming solutes in the urine.

Occupation can have an impact on the incidence of urinary stones. Physicians and other white collar workers have an increased incidence of stones compared with manual

labours. This finding may be related to differences in diet but also may be related to physical activity. Physical activity may agitate urine and dislodge crystal aggregates. Individuals exposed to high temperatures may develop higher concentrations of solutes owing to dehydration, which may have an impact on the incidence of stones.

In Yugi vaidhya chinthamani 800, one of the works of Yugimunivar, Kalladaippu is dealt under the chapter Kalladaippuroga nithanam. Yugi documented the sequential order of dissemination of knowledge of Kalladaippu from Lord Siva to till Yugi for the benefit of the people living in the world. There are literature evidences available in Theran and Agathiyar works which speaks about Kalladaippu.

In traditional *Siddha* literature so many preparations are available which are more valuable and clinically very effective. Among those formulations *Aaradhara parpam* is one of the mineral based *Siddha* preparations which is mentioned in *kannusamy parambarai vaithiyam* text, indicated for Neeradaippu ***(oliguria),*** kalladaippu ***(renal calculi),*** sadhaiadaippu ***(stricture of urethra)***,neer erichal ***(dysuria) ,*** and neer kaduppu ***(dysuria).*** The ingredients of this drug are Vediuppu ***(potassium nitrate)***, Venkaaram ***(borax)***, Silasathu ***(asphaltum)***, Andaodu ***(eggshell)***, Padikaaram ***(alum)***, and Palagarai ***(cypraeamoneta)***. It possess Anti lithotriptic activity, Diuretic activity, Anti inflammatory and Analgesic activity. Hence the author has chosen the drug for this study to validate its standardization, pharmacological (analgesic, anti inflammatory and diuretic) and analytical studies.

2.AIM AND OBJECTIVES

AIM :

To evaluate the ***Standardization and Pharmacological screening of the test drug "Aaradhara parpam"*** in an animal model .

OBJECTIVES :

Objectives are surfaced in the below mentioned points,

- Collection of various information relevant to the study from various *Siddha* and modern literature
- Identification of the ingredients
- Preparation of the test drug as per classical Siddha literature.
- Standardization of the prepared test drug Aaradhara parpam as per AYUSH Guidelines.
- Physicochemical analysis
- Biochemical analysis for determining acidic and basic radicals.
- Estimation of elements through instrumental analysis.

Pharmacological activities

Evaluation of pharmacological activity of test drug *Aaradhara parpam* in animal model

- Anti-inflammatory activity - Carrageenan-induced rat paw edema method.
- Analgesic activity - Hot plate method.
- Diuretic activity - Lipschitz method.

3.MATERIALS AND METHODS:

SOP for preparation of Aaradhara parpam:

The test drug *Aaradhara parpam* mentioned in siddha text kannusamy parambarai vaithiyam has been used for Neeradaippu ***(oliguria),*** Kalladaippu ***(renal calculi),*** Sadhaiadaippu ***(stricture of urethra)***, Neererichal ***(dysuria) ,*** Neerkaduppu ***(dysuria).***

INGREDIENTS:

1. *Purified vediuppu (Potassium nitrate)*	**-**	***1 palam (35 gram)***
2.Purified venkaram(Borax)	**-**	***1 palam (35 gram)***
3.Purified palagarai(Cypraeamoneta)	**-**	***1palam (35 gram)***
4.Purified karpoorasilasathu(Asphaltum)	**-**	***1 palam (35 gram)***
5.Purified padikaaram(Alum)	**-**	***1 palam (35gram)***
6.Purified andaodu(Egg shell)	**-**	***1 palam(35 gram)***
7.Lemon juice	**-**	***QS***

Procurement of Raw Drugs:

The raw drugs were procured from a well reputed country shop in Parrys corner, Chennai. All the ingredients were purified and the medicine was prepared in the *Gunapadam* laboratory in National Institute of Siddha.

Identification and Authentication of the drug:

- The plant materials were identified and authenticated by the Botanist, Department of Medicinal Botany, National Institute of Siddha.
- The raw drug was authenticated by the Faculty member, Department of Gunapadam, National institute of siddha.

Purification of the drugs:

- All the drugs mentioned here were purified as per the Siddha literature.

METHOD OF PURIFICATION:

PURIFICATION OF PADIKARAM[19]:

The Alum was dissolved into the water and it was filtered. Boil it well till it turns into a semisolid state. Then the mixture was cooled.

PURIFICATION OF VENKARAM[19]:

It is fried well untill it gets dried.

PURIFICATION OF SILASATHU[19]:

It is boiled in tender coconut until it gets dried.

PURIFICATION OF PALAGARAI[19]:

It is soaked in lemon juice for 12 hours and wash it. Dried it well.

PURIFICATION OF ANDA ODU[19]:

For the purification of one veesai (40 palam) amount of egg shell, take 250mg of kariuppu and 1500ml water mix it well. Kept the mixture of salt and water for one hour without disturbance. Then filter it. Then egg shell was soaked in the filtered water for one day, and it was heated till the reduction of $1/3^{rd}$ amount of water. Then egg shell was taken out and purified by removing the inner layer of the egg shell and washed with water. Dried it well.

PURIFICATION OF VEDIUPPU[19]:

1.4 gram vediuppu (potassium nitrate) was taken. Add 6500 ml of water into it and boil it well. Now add white yolk of 4 hens egg. The waste materials was float on the top and it was immediately removed. Then the above mixture was filtered into a another vessel and it was kept in vaccum. Then the next day it was dried in sunlight. Repeat this process again for seven times.

METHOD OF PREPARATION :

Vediuppu, Venkaaram, Andavodu, Palagarai, Karpoorasilasathu, Padikaaram was taken for each 1 palam (35 grams). The above ingredients was powdered well and ground in a

mortar with lemon juice for 12 hours (4 samam) continuously until it reached wax stage and made into villai and dried in sunlight.

Then baked limestone was taken, sprinkled water to make it efflorescent, removed impurities and mixed with water to a wax stage. A crucible and lid was made from it. The above prepared medicine was taken in a crucible. Then crucible and lid was sealed with clay smeared cloth and subjected into muzhupudam. After cooling it was opened. A whitish parpam was obtained. It was ground well and stored in a air tight glass container.

Labelling:

Date of preparation	-	17.01.2018
Name of the preparation	-	Aaradhara parpam
Dose	-	oneKundri (130mg) , Twice a day, After food
Adjuvant/Vehicle	-	Tender coconut(ilaneer).
Route of administration	-	oral
Duration	-	48days
Indications	-	Neeradaippu *(oliguria*), Kalladaippu *(renal* ***calculi),*** Sadhaiadaippu***(stricture of urethra****)* Neererichal ***(dysuria) ,*** Neerkaduppu ***(dysuria).***
Date of expiry	-	100 years
Reference	-	Kannusamy parambarai vaithiyam

INGREDIENTS OF AARADHARA PARPAM

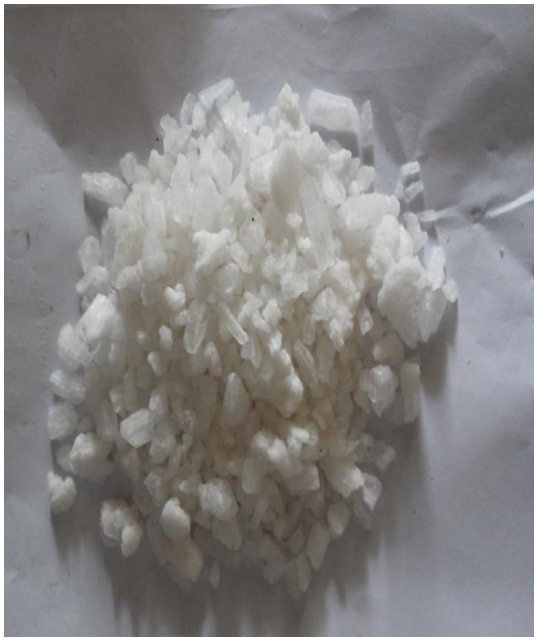
VENGARAM

BEFORE PURIFICATION

AFTER PURIFICATION

VEDIUPPU

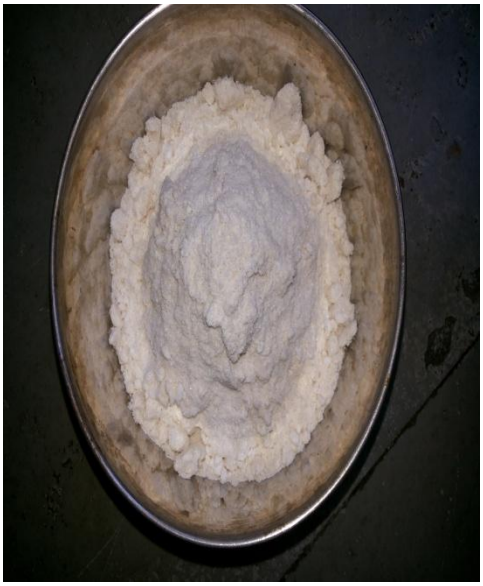
BEFORE PURIFICATION



AFTER PURIFICATION

PADIKARAM

BEFORE PURIFICATION **AFTER PURIFICATION**

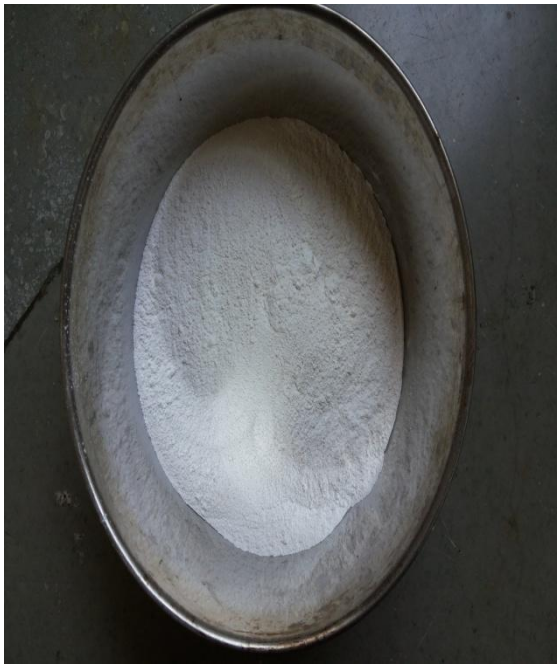


PALAGARAI

BEFORE PURIFICATION **AFTER PURIFICATION**

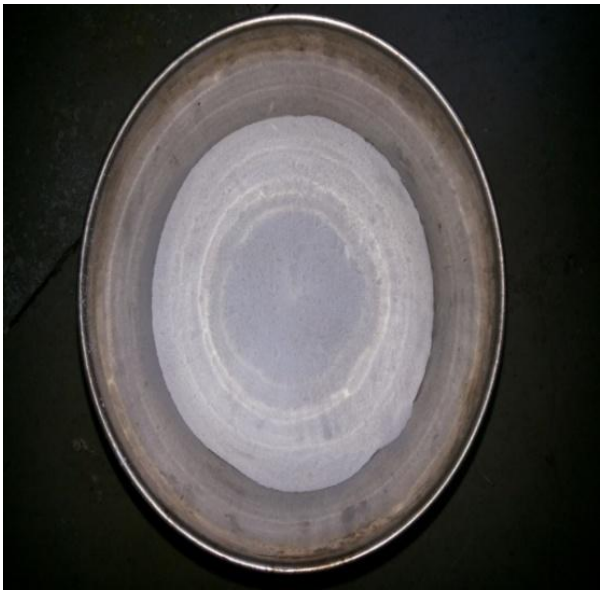
SILASATHU

BEFORE PURIFICATION **AFTER PURIFICATION**



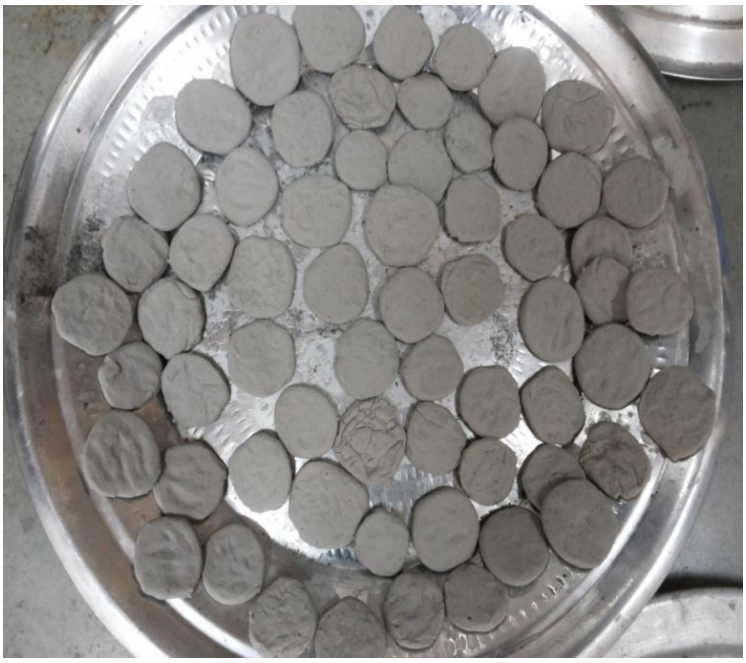
ANDA ODU (EGG SHELL)

BEFORE PURIFICATION **AFTER PURIFICATION**



LEMON JUICE

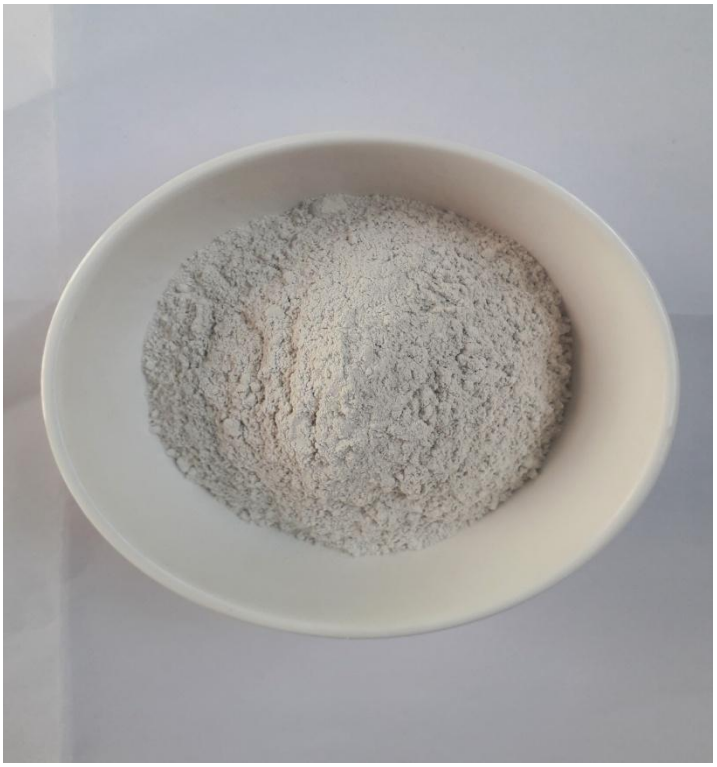
VILLAI



MOOSAI

PUDAM

AARADHARA PARPAM



4.LITERATURE REVIEW

4.1.GUNAPADAM REVIEW:

VEDIUPPU(potassium nitrate)

Synonyms:

- Padairaasan
- Inangan
- Poonathan
- Boomi koormai
- Navachaara mithru
- Pottiluppu

General characteristics of vediuppu:

“மல்லாரு மட்டகுன்ம மாதருத ரக்கட்டி

கல்லா மதைப்புநீர்க் கட்டருக - லெல்லாமெ

கம்பிகம்பி என்றுங் கருவுண்டா மங்கிநின்ற

கம்பிகம்பி யென்றுரைக்குங் கால்”

It cures diseases like 8 types of Gunmam (ulcer), Sobai (dropsy), Karpashayakatti (uterine tumour), neersurukku (dysuria), and moothira kiricharam (burning micturition).

ACTION:

- Refrigerant
- Demulcent
- Astringent
- Diuretic

Purification:

1.4 gram vediuppu (potassium nitrate) was taken. Add 6500 ml of water into it and boil it well. Now add white of 4 hens egg. The waste materials was float on the top and it was immediately removed. Then the above mixture was filtered onto a another vessel and it was kept in vaccum. Then the next day it was dried in sunlight. Repeat this process for seven times.

Siddha Formulations Using vediuppu As Ingredient:

1.Vediuppu chenduram

Dose :130-260mg

Adjuvant : Ilanner, Mullanki saaru, Vaazhai kattai saaru

Indications : kalladaippu, Sadhaiadaippu, Neer adaippu

2.Vedikaara silasathu parpam

Dose : 130mg

Adjuvant : Ghee, Butter

Indications : Neer kattu, Neer erichal, Neer surukku

3.Kaara vediuppu parpam

Dose :260-390mg

Adjuvant : Ilaneer

Indications : Neer Kattu

4.Muthuchippi parpam

Dose :130-260mg

Adjuvant : Ghee, Butter

Indications : Neer Adaippu, Moolam, Suram

5.Vediuppu Chunnam

Dose : Thuvarai Alavu

Adjuvant : Ilaneer

Indications : Kalladaippu, Sadhaiadaippu, Neer Kattu

6.Ekku Chenduram

Dose : 488mg

Adjuvant : Ghee

Indications : Kalladaippu, Sadhaiadaippu, Neer Kattu, Neer Adaippu

7.Sindhu Vallathi

Dose : Chundaikaai

Indications : Kalladaippu, Sadhaiadaippu, Neer Adaippu

8.Naaga Parpam

Dose : 130mg

Adjuvant : Ghee, Butter

9.Neelakanda Paalai

Dose : 65-130mg

Indications : Mega Vaayu, Thadippu, Sori

10.Kaala Kanda Mega Narayana Chenduram

Dose : 65-130mg

Adjuvant : Ghee, Butter, Honey

Indications : Gunmam, Swasakaasam, Aseeranam

11.Vediuppu Seyaneer

12.Vedi Chunna Seyaneer

13.Thutha Maara Dravagam

14.Ilagu Saara Seyaneer

VENGARAM-borax (sodium biborate)

It is composed of boric acid and soda.

Synonyms:

- Porikaram
- Karam
- Urukkumithiran
- Danganam
- Thoomathaiyadakki

Organoleptic characters:

Taste **:** Sweet mixed with astringent

Character **:** Heat

Division **:** Coolant

Actions:

- Diuretic
- Astringent
- Lithodialysis
- Emmenogogue

General characteristics-

“சொறிபுடை யெண்குன்மநமை சோயாசம்

பறிகிரகணி கல்ஓனம் பன்னோய் நெரியைத்

தடங்கணங்க பங்கிருமி சர்ப்பவிட சந்நி

யிடங்கணங்க லக்கிற்போ மென்”.

-siddha materia medica

It cures Kalladaippu (urinary calculus), Moothira kiricharam (burning micturition), Kirumi (worm infection), Moolam (haemorrhoids) and Naala pun (venereal ulcer with pus).

Purification:

- It is fried well untill it gets dried.
- It is washed with filtered water of cows dung, and dried it well .
- It is soaked in buffalo urine for 72 mins(3 naazhigai).
- It was initially fried and grinded with lemon juice and finally dried in sunlight.

Siddha Formulations Using venkaram As Ingredient:

1.Nerunjilmul Chooranam

Dose : 650-1300mg

Adjuvant : Ilaneer, Veneer

2.Venkara Parpam

Dose : 130mg

Adjuvant : Ghee, Butter

Indications : Neer Adaippu, Neer Erichal, Neer Surukku

3.Kaara Vediuppu Parpam

Dose : 260-390mg

Adjuvant : Ilaneer

Indications : Neer Kattu

4.Pakka Soolai Rasam

Dose :1-2 Mathirai

Adjuvant : Velaatu Paal, Pasuvin Paal

Indications : Moothira Sambandhamana Rogam, Eral Veekam, Thega Veekam

5.Gowri Chindhamani Ranamugathera Rasa Chenduram

Dose : 130mg

Adjuvant : Aavarai Vidhai Thailam

Indications : 18 Vagai Sadhaiadaippu, 20 Vagai Moothira Kirichara Noi, 6 Vagai Moothira Paalai.

6.Jalamanjari

Dose : 1-2gm

Adjuvant : Ilaneer, Mullanki Saaru, Sombu Theneer

Indications : Neer Adaippu, Neer Erichal, Neer Surukku, Kalladaippu, Neer Arugal

7. Siruneer Kallukku Kudineer

Indications : Siruneeril Undagam Karkal Neengum.

8.Kaantha Chooranam

Dose : 3 Viral Alavu

Adjuvant : Ghee

Indications : Neer Kaduppu, Gunmam

9.Anandha Vairavam

Dose : 2 Mathirai

Adjuvant : Mulai Paal

Indications : Neer Kaduppu, Paambu Visham, Thel Visham.

10.Venkaara Sanjeevi Mathirai

Dose : 488mg

Adjuvant : Ulli Thailam

Indications : Neer Surukku, Vatha Pini

EGG SHELL(anda odu):

Egg shell contains calcium.

Purification:

For the purification of one veesai (40 palam) amount of egg shell, take 250mg of kariuppu and 1500ml water mix it well. Kept the mixture of salt and water for one hour without disturbance. Then filter it. Then egg shell was soaked in the filtered water for one day, and it was heated till the reduction of 1/3rd amount of water. Then egg shell was taken out and purified by removing the inner layer of the egg shell and washed with water. Dried it well.

SIDDHA FORMULATIONS USING EGG SHELL AS INGREDIENT:

1.Mutai Ottu Parpam.

Dose : Kadalai Alavu

Vehicle : Butter

Indications : Asthi Suram, Moorchai, Kaasa Noi.

2.Thaalaka Chenduram.

Dose : Kundri

Vehicle : Peeligai, Gunmam, Vaayu.

3.Anda Sathu.

Indications : Eelai Rogam, Manthara Kaasam.

4.Venkala Chenduram.

Dose : Kundri

Vehicle : Vellam

Indications : Gunmam, Megam.

5.Vengaara Mezhugu.

Dose : 4 To 5 Kundri

Indications : Neer Adaippu, Neer Kattu.

6.Vanga Chunnam.

Dose : 65 To 130mg

Vehicle : Honey

Indications : Vellai, Nari Thalai Vatham, Vaatha Noi.

7.Anda Seyaneer.

8.Ubayamuga Guru Dravagam.

9.Anda Chunnam.

10.Anda Neer.

PADIKARAM-alum (Aluminium potassium sulphate)

It is colourless, transparent crystals with acid. Alum is a general name for a class of double sulphates containing aluminium and such metals as potassium, ammonium, iron etc.

Synonyms

- Cheenam
- Padigi

Organoleptic characters

Taste **:** sweetish astringent

Potency **:** heat

Division **:** pungent

Actions

- Astringent
- Diuretic
- Hemostatic
- Antispasmodic

General characteristics – படிகாரம்

“சீனமென்னும் காரமது சீறிவரு பல்லரணை

ஆனைக்கால் கண்ணோய் அனிலமொடு மாநிலத்தில்

துன்மாங்கிசம் வாயு தோலாத உள்ளழ்லை

குன்மமிவை போக்குமென கூறு”.

It cures Pallaranai (gingivitis), Kan noi (eye diseases), Yaanaikkaal (elephantiasis), tumour, Ulsoodu (sense of heat), Gunmam (gastric ulcer), Adhikuruthi azhutham (hypertension), Kazhichal (diarrhoea), childrens vomiting, Kakkuvaan (whooping cough with expectorant).

Purification Of Padikaram

The Alum was dissolved into the water and it was filtered. Boil it well till it turns into a semisolid state. Then it allowed to cool itself.

SIDDHA FORMULATIONS USING PADIKARAM AS INGREDIENT:

1.Mirudharsingi Parpam

Dose : 65-130mg

Adjuvant : Ghee, Butter

Indications : Neer Surukku, Neer Erichal, Vellai

2.Naaga Parpam

Dose : 130mg

Adjuvant : Ghee, Butter

Indications : Neer Erichal, Vellai

3.Visha Bedhi Sankarani

Dose : 260mg

Adjuvant : Honey

Indications : Vaanthi Bedhi, Siruneer Adaippu

4. Jalamanjari

Dose : 1-2gm

Adjuvant : Ilaneer, Mullanki Saaru, Sombu Theneer

Indications : Neer Adaippu, Neer Erichal, Neer Surukku, Kalladaippu, Neer Arugal

5.Neer Kattu Maruthuvam

Dose : 260mg-650mg

Adjuvant : Seeraga Thool, Adhimadhura Thool, Karkandu

Indications : Neer Kattu, Neer Erichal, Sadhai Adaippu

6.**Padikara Parpam**

Dose :130-520mg

Adjuvant : Butter

Indications : Neer Erichal, Neer Adaippu

7.Vediuppu Seyaneer

8.Vediuppu Madakku Seyaneer

9.Makaa Seyaneer

10.Ilagu Saara Seyaneer

11.Egadhasa Mugath Dravagam

12.Eliya Kattu Vagai Dravagam

13. Eliya Chendura Dravagam

14. Kattuvagai Dravagam

15.Magaseena Dravagam

16.Mezhuguvagai Seyaneer.

PALAGARAI(Cypraea moneta):

Synonyms

- Kavadi
- Sogi
- Varadi

Organoleptic characters:

Taste **:** Bitter

Actions:

- Expectorant
- Sedative
- Febrifuge

General characteristics:

“மந்தந்தா கங்கிரகணி மாவிடச் சுரங்கண்ணோய்

தொந்தம் பரிநாமச் சூலைகய - மிந்த

வுலகறையைக் காலொடிவை யோடு நரைத்த

பலகறையை காணினியம் பார்"

It cures Kan noi(eye diseases), Dhaagam(thrist), vatha diseases, Seriyamai(indigestion), Kaamalai(jaundice), Kalleral veekam(hepatomegaly), Maneeral veekam(spleenomegaly), Eraippu(bronchial asthma), Elaippu noi(tuberculosis)**.**

Purification:

- ✓ It is soaked in lemon juice for 12 hours and wash it. dried it well.
- ✓ 35 gram of palagarai powder was mixed with 350 gram thamaratham pazha juice and kept it one day, next day again add 350 gram of fresh thamaratham pazha juice and kept in sunlight, and the same process was repeated for 15 days.

SIDDHA FORMULATIONS USING PALAGARAI AS INGREDIENT:

1.Palagarai parpam

Dose **:**¼ Kadalai alavu

Adjuvant **:** Milk

Indications **:** Paandu, Nalir, Sanni.

2.Palagarai chenduram

Dose :325 – 650mg

Indications : Neer erichal, Piramegam.

3.Rasa chinthamani

Indications **:** Suram, Sanni

4.vediuppathi chunnam

Dose : 1/8 – 1 varagan

Adjuvant : ilaneer

Indications : Kalladaippu, Sadhai adaippu, Neer kattu

5.Vishnu chakara mathirai

Dose **:** 130mg

Adjuvant **:** Honey

Indications **:** Pakkavatham, Vikkal, Sobai

6.Palagarai chunnam

Dose **:** 130mg

Adjuvant **:** Honey

Indications **:** Soodhaga vaayu, Magotharam.

7.Soola kaja kesari

Dose **:**260mg

Indications **:** Soolai

8.Sambu kaathi mathirai

Dose **:** Kadalai alavu

Indications **:** Parinama soolai

KARPOORA SILASATHU:

Synonyms:

1. Kaaya sithi chunnam
2. Salaprithivi
3. Kal guru
4. Kaanthiyon
5. Kulasila mani
6. Ubarasathilathi
7. Aathinuda vithu
8. Kannathon.

Actions:

- Diuretic
- Lithotriptic
- Astringent
- Tonic
- Haemostatic

General characteristics:

“கல்லடைப்பு மேகங் கனதூலம் வித்திரதி

சொல்லடைக்கு நீரருறுகற் சோணிதக்கான் - மெல்லிடையார்க்

கில்லகச்சத் தில்லையெனு மிந்திரிய நட்டமுமாங்

கல்லகச்சத் தில்லையெனுங் கால்”

It cures Kalladaippu (renal calculi), Athithoolam (obesity), Putru noi (cancer), Neer surukku (dysuria). It has aphrodisiac activity.

Purification:

- ✓ It is boiled in tender coconut until it gets dried.
- ✓ It is boiled with milk and washed with water and make it dry.
- ✓ It is boiled with lemon juice and then soaked into latex of clitoria for 2 days. Wash it water and make it dry.

SIDDHA FORMULATIONS USING SILASATHU AS INGREDIENT:

1. Vedi Kaara Silasathu Parpam

Dose : Kundri
Vehicle : Ghee, Butter
Indications : Neer Kattu, Neer Erichal, Neer Surukku

2. Pavazha Silasathu Parpam

Dose : Kundri
Vehicle : Ghee, Butter
Indications : Vellai, Madhumegam, Neer Surukku, Neer Erichal.

3. Neer Kattu Maruthuvam

Dose : 2 To 5 Kundri
Vehicle : Karkandu
Indications : Sottu Moothiram, Neer Kattu, Sadhai Adaippu

4. Karpoora Silasathu Parpam

Dose : 1/4 Panavedai
Vehicle : Mullanki Juice
Indications : Kalladaippu, Neer Kattu, Neer Kaduppu

5. Thirikadugu Mathirai

Dose : 1 To 2
Vehicle : Water
Indications : Adhi Saara Sanni Badha Suram

6. Silasathu Chenduram

Dose : 3 To 6 Kundri

Vehicle : Ghee

Indications : Shayam, Kaasam, Kurithi Kuraivu

7. Pavala Vanga Chenduram

Dose : Kundri

Vehicle : Seenthil Sarkarai

Indications : Linga Putru, Sala Kazhichal, Kuri Erivu

8.Venkala Chenduram

Dose : Kundri

Vehicle : Vellam

Indications : Gunmam, Megam

9.Gandhaga Chenduram

Dose : Kundri

Vehicle : Honey

Indications : Neer Kaduppu, Kalladaippu, Sobai

10.Kalmatha Parpam.

Dose : 5 To 10 Kundri

Vehicle : Butter

Indications : Bramiyam, Enbu Koodu, Kanai Soodu

LEMON (elumichai):

Synonyms:

- Sambeeram
- Sambiko
- Kombinuda pazham
- Thandha sandha kadha
- Soebeesam
- Thesiyuda pazham
- Sembiroedhagam

Parts used:

Leaf, fruit, oil

Organoleptic characters:

Taste **:** pulippu

Potency **:** heat

Division **:** kaarppu

Action:

- Coolant

General characteristics:

“தாகம் குநகநோய் தாழாச் சிலிபதநோய்

வேகங்கொள் உன்மாதம் வீறுபித்தம் - மாகண்ணோய்

கன்னனோய் வாந்தியும்போங் கட்டுவா தித்தொழிலில்

மன்னெலுமிச் சங்கனியை வாழ்த்து”

✓ It cures Vaanthi(vomiting), Neer vaetkai(dysphagia), Kan noi(eye diseases), Kaathu vali(ear ache), Naga sutru(nail infection), Vaai kumattal(nausea).

✓ It is rejuvenative.

SIDDHA FORMULATIONS USING LEMON OR LEMON JUICE AS INGREDIENT:

1.Ponnaridhara Parpam.

Dose : 1 Panavedai

Indications : Seedha Suram, Naangaam Murai Kaaichal, Pavuthiram, Kirandhi Pun, Soolai.

2.Sanni Vadha Vairavam.

Dose : Ulundhu Alavu

Indications : Vida Suram, Sanni, Eelai, Erumal.

3.Aanandha Vairavam.

Dose : Ulundhu Alavu

Indications : Vaadha Suram, Sanni, Kulir Suram.

4.Maha Koozhpaanda Legium.

Dose : 5 Varagan Edai.

Indications : Asthi Suram, Sobai, Kamalai, Biramiyam.

5.Suvarna Boopathi Kuligai.

Dose : 1 Mathirai

Indications : Sanni Thodam, Eelai, Kaasam, Neer Izhivu, Magodharam, Mugavatham

6.Paadana Chunnam.

Dose : 2 Arisi Alavu

Vehicle : Ghee, Honey

Indications : Sanni Thoda Suram.

7.Nava Mani Chenduram.

Dose : 1/2 To 1 Kundri

Vehicle : Honey

Indications : Soodhaga Katti, Peruvayiru, Soodhaga Sikkal.

8.Linga Kattu Chenduram.

Dose : 2 Arisi

Vehicle : Honey

Indications : Sanni, Vaadha Suram.

9.Sithadhi Legium;

Dose : Kottai Paaku

Indications : Paandu, Akni Mantham, Sobai.

10.Inji Rasayanam.

Dose : Nellikaai Alavu

Indications : Vaandhi, Nadukkam, Kazhichal, Ruthra Vaayu.

11.Ponnankanni Nei.

Dose : 1 Karandi.

Vehicle : Mega Kaangai, Kai Kaal Erivu, Vaai Naatram.

12.Aya Sambeera Karpam.

Dose : Pilavu Ondru

Indications : Paandu, Sobai

13.Thiriloga Chenduram.

Dose :Panavedai

Vehicle :Sanjeevi Chooranam

Indications :Paandu, Pitham, Piramegam, Vaayu.

14.Naarayana Mandooram.

Dose : Puliyan Kottai Alavu

Vehicle : Hot Water, Butter Milk

15.Sanni Vadha Vairavam.

Dose : 65mg

Indications : Sanni, Eelai, Erumal, Vida Suram.

16.Sorthennai Thailam.

Dose : 1.33ml

Indications : Vatham 80, Valippu, Sanni

17. Kesari Legium.

Dose : 1 To 2 Varagan

Indications : Pitham, Anna Veruppu, Vayiru Vali.

18.Jathi Jambeera Kuzhambu.

Dose : 1/4 To 1 Kundri

Indications : Vaanthi, Vikkal, Thaagam, Paandu, Veppu, Moorchai.

4.2.MINERALOGICAL REVIEW:

CHEMICAL ASPECT

ALUMEN

Alum or alumen refers to a specific chemical compound and a class of chemical compound. The specific compounds is the hydrated aluminium potassium sulphate with the formula k2so4.AL2so4 (24 H20). It is colourless transparent crystal with acid sweetish astringent taste.

GENERAL :

Molecular formula : KAL(so4).12H20.

PHYSICAL CHARACTERISTICS:

Appearance : White crystal, Transparent

Colour : Colourless

Taste : Acid, Sweetish, Astringent Taste

PROPERTIES:

Melting point - 660.370

Boiling point - 24670ºC

Specific gravity - 2.6989

It is silvery – white metal, it soft light relatively non toxic with a light thermal conductivity and high corrosion resistance.

OCCURRENCE:

Chiefly found with peroxide of iron in silajit or in alum earth of Nepal. For medicinal purpose it is got dissolving it in boiling water, straining the solution and evaporating it so as to obtain crystals.

ACTIONS:

- Astringent
- Anti spasmodic
- Anti septic
- Haemostatic
- Caustic
- Irritant and purgative in large doses
- Emetic in repeated doses

MEDICINAL USES:

1. It is useful in haematuria
2. For urethral structure injection made of alum 1- thola, blue vitriol – 70 grains (4.5gms) and water is used as on urethral injections.

BIOLOGICAL VALUE

- Alum is used in many submit vaccine as an adjuvant to enhance the body response to immunogens
- Powered alum is commonly used as remedy for ulcer
- Preparation of alum is used to bleeding disorders.

POTASSIUM NITRATE

Eng name	:	Saltpeter, Nitrate of potash
Tamil name	:	Potill uppu
Mal name	:	Vetiuppu

OCCURENCE :

Bengal, Punjab, and upper India, naturally as efforescence onthe soil, for medicinal use, the earth containing the curd salt is dissolved in water, strained and Recrystallised by boiling and evaporation

PHYSICAL PROPERTIES

Molecular formula	:	KNO_2
Appearance	:	white crystals Odour , sour or salty
Solubility	:	36gm/100ml water
Melting point	:	333ºc(631ºF)
Vapor density	:	3.00
Vapor pressure	:	negligible@20c
Stability	:	stable under ordinary condition of use andstorage
Molar mass	:	85.103g/mol
Atomic no	:	19
Atomic mass	:	39.0983

ACTION:

- Refrigerant
- Demulcent
- Astringent

GENERAL PROPERTIES:

- ❖ It is a salt which is prepared after five process from fullers earth.
- ❖ It is a salt prepared from the human skull.
- ❖ It consists of white crystalline masses possessing a saline taste, it exists in a natural state in many parts of India.
- ❖ Those sold in the bazaars are sometimes are not sufficiently pure for internal use and it may be readily cleaned by dissolving it is hot water straining and setting the solution aside to crystallise needle shaped crystals will be formed and they are pure.

MEDICINAL USES:

- ❖ Salt petre stimulate the skin and the kidney increases perspiration and flow of urine and so cooling the body. It is very useful in fevers in inflammatory affection, common cold, rheumatism, gout bronchitis etc.
- ❖ Potassium nitrate in solution is a refrigerant efficient, diuretic and diaphoretic. It acts on the vascular system and thus reduces the frequency of the pulse.
- ❖ It is useful also in the early stages of dropsy in case of small pox measles influenza, catarrh, gonorrhoea, acute rheumatism, bleeding from the lungs, stomach, uterus or other internal organs attended by fever.
- ❖ A mixture of nitre 2 parts and leaf juice of the radish 1 part is given in dose of 80 grains to relieve scalding and retention of urine also suppression or scantiness of urine.
- ❖ In obstinate cases of leucorrhoea a combination of nitre 10 grains and alum 5 grains is recommended to be taken thrice daily.
- ❖ It may be advantageously given with infusion of Moringa root.

KARPOORA SILASATHU:

English : Sphalt, Mineral Pitch, Plaster of paris

Hindi : Silajita

SOURCE:

Ejected out of rocks during hot weather in the lower Himalayas. Vidhya and other mountain tracts and Nepal where iron abounds, naturally flowing out from between the fissures in the rocks or it may be a tar formed in the earth from the decomposition of vegetable substances.

CONSTITUENTS:

Silasathu contains an oil which when distilled is known as ichthyol. Benzoic acid and benzoates which are present in silasathu in large quantities are considered by chopra to be the main active principles.

ACTION:

Locally Antiseptic, Anodyne, Parasiticide, and Anti phlogistic. Internally Diuretic, Lithontriptic, Alterative, Tonic, slightly Laxative, Respiratory stimulant, Expectorant, Intestinal stimulant.

PHYSICAL PROPERTIES OF GYPSUM(KARPOORA SILASATHU):

LUSTRE:

Vitreous, silky, dull

TRANSPARENCY:

Transparent, opaque, translucent.

COLOUR:

Colourless to white.

TENACITY:

Flexible.

USES:

- It is specially employed in genitor urinary diseases and in diabetes.
- It is mainly used in Gall stones, Jaundice, Enlarged Spleen, Anasarca, renal stone and bladder calculi, Anuria.
- It is also used in Ascites, Uremia.
- Silasathu is used as an external application for inflammatory swellings, Arthritis.
- In strangury or painful Micturition Silasathu is used with other diuretic and demulcents.

CYRSTALLOGRAPHY OF GYPSUM(KARPOORA SILASATHU):

CRYSTAL SYSTEM:

Monoclinic

CLASS:

2/m - prismatic

Morphology:

Thin and thick tabular crystals.

Crystals may have wraped surfaces, or be bent or twisted.

Rosette- like clusters of lenticular crystals are common.

VENGARAM:

PHYSICAL PROPERTIES OF VENGARAM

Chemical formula	: Na2B4O7.10H2O
Composition	: Hydrous sodium borate
Colour	: Colourless, white, light grey.
	Also in light tints of blue, green and yellow.
Streak	: White
Hardness	: 2- 2.5
Transparency	: Transparent to opaque
Specific gravity	: 1.7
Luster	: Itreous to dull
Other ID marks	: 1.has a sweetish, metallic taste
	2.dissolve in water.
In group	: Borates; hydrous borates.

BORAX HEALING AND PREVENTIVE PROPERTIES:

Borax protects against the accumulation of fluids in the body. It is effective as an oxidate in fluoride toxicity; and can remove fluorides from the body.

ANTI- MICROBIAL:

Borax is toxic to insects, parasites, protozoa and bacteria.

FUNGICIDE:

Effective against moulds and fungi, internally and externally.

IMMUNE SYSTEM ENHANCER:

PROMOTES HEALING OF WOUNDS.

Reduction and control of inflammation.

TOXIN REMOVAL:

- ✓ **Protection from heavy metals.**
    - Stabilizer of calcium, silicon, copper and magnesium levels inhibits calcification, boran sufficiency normalizes calcium levels, preventing both abnormal calcium deposition and bone weakness.
- ✓ **Obesity.**
- ✓ **Cancer :** boron may be a preventive for prostate cancer.
- ✓ **Antiseptic :** very effective for bladder infection and urinary tract infection.

USES:

- ➢ Venkara parpam cures pitha diseases like burning micturition and kalladaippu.
- ➢ Borax is given internally in doses varying from 10- 30 grains in acidity of stomach, dyspepsia and intestinal organism. It commonly mixed in decoction for kalladaippu.
- ➢ In small doses it is given to children as a laxative.
- ➢ It is also used in loss of appetite, painful dyspepsia, cough, asthma and diarrhoea.
- ➢ Externally borax is used in lotion in acne, freckles, cholasma.
- ➢ Boro- glycerine is used as an antiseptic lotion in purulent ophthalmia and diphtheria.

4.3.ZOOLOGICAL ASPECTS OF PALAGARAI[14]

***Cypraea moneta, linn**

CLASSIFICATION

Kingdom	-	Animalia
Phylum	-	Mollusca
Class	-	Gastropoda
Order	-	Sorbeoconcha
Family	-	Cypraeidae
Genus	-	cypraea
Species	-	moneta

VERNACULAR NAMES:

Tamil	-	chozhi, palagari
English	-	parcelenous shells, cowry
Sanskrit	-	varatika, varataka
Arabic	-	Sadaf
Hindi	-	Cowrie, kowdi
Malayalam	-	Kavati
Kannada	-	Kavadi
Bengali	-	Beya
Gujarathi	-	Codi

HABITAT :

The Cowri lives in inter tidal rocky areas. It can be found on and under rocks in shallow water and on exposed reefs at low tide. It feeds an algae and Marine vegetation growing on loose rocks and pieces of dead coral.

SHELL DESCRIPTION[9]:

- Small convolute, glossy shells of variegated colours of oblong oval shape Varying in size from a tamarind seed to an almond.
- The upper face in smooth shining and convex. Base is compressed with a Cleft in the center which runs longitudinally. The margin of the Cleft is serrated on one side and depressed on the other.
- The fresh shells consist of a cellular gelatinous tissue filled with calcareous matter (earthy salts).They are insoluble in water, soluble in hydrochloric acid with effervescence.
- They contain phosphate florid and carbonate of calcium, magnesium phosphate manganese and sodium chloride.

DISTRIBUTION:

The entire tropical Indian pacific oceans from east Africa to Central America including Northern Australia.

COMPARISON:

Cypraea moneta occasionally has an orange rine on the dorsum similar to cypraea annulus. But it is distinguished by its heavy margin. Juvenile specimens of the 2 species are difficult to separate.

REMARKS

This is the well known money cowry which was used for currency in some parts of Africa, Asia & Oceania. It is an extremely common shell in its tropical range last century Vast quantities were collected on the east coast of Africa and shipped to West Africa, where the shell does not occur naturally. In the year 1867 alone, 67000 hundred

weights passed through the part of Lagos, to be used as payment for oil seed, under this pressure rapidly devalued as a currency in the latter part of nineteenth century.

RESEARCHES ABOUT PALAGARAI:

1.Antipyretic, anti-inflammatory,anti-microbial activity[45]

GrasianImmanuel ,et al.., studied the antipyretic, anti microbial activity of palagarai. In the study, the efficient of drug prepared from the shell of mollusk cypraea moneta to reduce fever and heal wounds in albino rats as well as to inhibit microbial activity in vitro. this drug efficiently reduced the body temperature of rats of rat that was made hyperthermia by yeast injection. Similarly, the wound healing process ending with the production of scar indicated that tissue regeneration was completed in drug administered rates. sometimes pathogenic microbes can enter though the wound and produce pus. In this experiment, treated rats did not produce pus on the contrary to control rats. Thus cypraea moneta is found to be effective in anti-pyretic, anti-inflammatory, anti-microbial in experimentally induced albino rats.

4.4.BOTANICAL REVIEW

CITRUS LEMON

BOTANICAL CLASSIFICATION

*** kingdom** - plantae, Angiosperms, Eudicots, Rosids

*** Order** - Sapindales

*** Family** - Rutaceae

*** Genus** - Citrus

*** Species** - C.limon

*** Binomial name** - Circus/lemon

DIFFERENT NAME IN LEMON

***English** **:** lemon,Lime

***Gujarat** **:** Limbu,Motu limbu

***hindi** **:** Nimbu

***Kannadam** **:** Nimbe

***Malayalam** **:** Cherunkaram

Description

Much branched thorny shrub leaves ovate, petiole slightly winged. flowers and white, axillary, solitary or clustered. Fruits oblong, bright yellow with terminal nipple, pericarp thick and seeds many.

Throughout india, cultivated in plains and hills in upto 1,200 m elevation .

Habit : Cultivated in India, Terminal in the C.P.Kumaon and Northern India.

Varieties : Two kind of limiese are found in the Indian market .the lemon though belonging to the same stock.

Parts used : Rind of the ripe fruits and expressed juice of the ripe fruits.

Constituents : A pale yellow volatile oil derived on either by distillation or by simple expression from the fresh outer part of the pericarp or finely grated rind of the fruits. lemon in richer in juice and citric acid than lime. The average amount of citric acid available from100c.c.pf lemon juice is 3-7 percent.

Action:

Stomachic and carminative

Oil:

It is bitter, aromatic, stomachic and carminative n doses of from 2 to 4 drops but is rarely employed in the form.

Juice:

The expressed strained juice of the ripe fruits is a valuable and refrigerant, primarily anti alkaline and secondarily antacid.

Bark:

It is as febrifuge and seeds as a vermifuge .pulp is exceedingly acid.

ALKALOIDS[25]:

- Limonene is a principle constituent of essential oil, others are citronella, n -nonanal,n-decanal, n-dodecanal , linalyl-acetate, citronellyl acetate, methyl anthranilate, lipophilic flavonoids including sinestin and furocoumarins.
- The chief flavonoids are naringin ,and neohesperidin , dihydrochalcones hesperidone and rutin. It also contains glycosyl apigenin, p-caryophyllene,limocitrol,abscisic acid, gibberllic acid, abscisin II,auxin and isorhamnetin.

CHEMICAL CONSTITUENTS OF LEMON:

- Lemon and other citrus fruits contain different chemicals and thought to have some health benefits. They contain a Terpene called limonene which gives there characteristic lemon smell and taste. Lemon contains the significant amount of citric acid, that is why they have a low PH and a sour taste. They also contain vitamin C (ascorbic acid)which is essential to human health.

- 100 millilitres of lemon juice contains approximately 50mg of vitamin C(55% of the recommended daily value) and 5 gms of citrus acid.

Medicinal Uses of Lemon Juice[28]

- Lemon juice and gun powder is applied topically for scabies.
- Juice of the baked lemon is an excellent remedy for cough when mixed with an equal quantity of sugar or honey and taken in tea spoonful doses.
- Fresh lemon juice is recommended to be taken in the evening for the relief of dyspepsia with vomiting and bilious headaches.
- Preserved with sugar or honey lemons are recommended for sore Throat and are considered to act detergent they are administered before purgatives to prepare the body for them and afterward to check excessive action.
- Lemon plays an important part in perfumery also .The quality of Indian lemon peel is almost equal to the Sicilian variety and it Has been estimated that if extraction of lemon oil is attempted from the Indian lemon peel, it will not be a failure commercially

The fruits in the pickles is useful in hypertrophy of spleen..lemon peel is Stomachic and carminative .Oil of lemon is stimulant and rubefacient when applied externally. Lemon juice is the one of the best remedies for scurvy and serves as a refrigerant in febrile and inflammatory conditions, acute rheumatism, dysentery and diarrhoea. The fruits is the digestive carminative, stomachic, laxative, anthelminitic, stimulate, antiseptic and is useful in flatulence, dyspepsia, constipation, colic and Helminthiasis.

NUTRITIONAL VALUE PER 100 g OF LEMON JUICE[25]:

- Energy - 129 kcal
- Carbohydrates - 10.9 g
- Protein - 1.5 g
- Fiber - 1.3 g
- Calcium - 90 g
- Phosphors - 20 mg
- Iron - 0.3 mg

- Thymine - 0.02 mg
- Riboflavin - 0.03,mg
- Vitamin C - 64 mg
- Energy - 59 kcal

NUTRIENTS – AMOUNT:

- Calories - 15.25
- Carbohydrate - 5.27g
- Sugar total - 2.08g
- Fat total - 0.00g
- Protein - 0.15g

VITAMINS:

Vitamin A (IU) - 12.20

Thiamine BI - 0.02mg

Roboflavin - B2 -0.01mg

Niacin B6 - 0.06mg

Vitamin B6 - 0.03mg

Vitami9n B12 - 0.00mg

Vitamin C - 28.06mg

Folate - 7.87mcg

Pantothenic acid - 0.07mg

Biotin - 0.19mg

Vitamin K - 0.00mg

Vitamin E - 0.14mg

MINERALS:

- Calcium - 4.27mg
- Copper - 0.02mg
- Iron - 0.05mg
- Magnesium - 3.66mg

- ❖ Lemon oil is attempted from the Indian lemon peel, it will not be a failure commercially.
- ❖ The rind of the fruit is sour, heating, with a sharp taste; anthelmintic; removes" vata", "kapha", lung troubles.
- ❖ The rind of the fruit is stomachic and carminative. the oil mixed with glycerine is applied to the eruption of acne.
- ❖ The juice of the ripe fruit is a valuable anti scorbutic and refrigerant.
- ❖ In scurvy, it is one of the best remedies we posseses, both as a prophylactic and as a curative.
- ❖ In acute rheumatism and gout, in some form of acute tropical dysentery and diarrhoea etc., it has been successfully employed.
- ❖ As an antidote to some acro-narcotic poisons it often proves effectual.
- ❖ The fruit in the form of pickles is useful in hypertrophy of spleen. Lemon peel is stomachiac and carminative.

PHARMACEUTICAL REVIEW:

PARPAM:

Parpam is equivalent to calyx, which is prepared by a process of calcination. Parpam is apparently a tamilazed form of the Sanskrit word bhasma. Parpam has held the ground in siddha medicine. Parpam is prepared from different sources like metals, minerals, marine products etc...

PURIFICATION OF THE RAW DRUG

The following processes are involved

- Elimination of harmful matter from the drug.
- Modification of undesirable physical properties of the drug.
- Conversion of some of the characteristics of the drug to different stages.
- Enhancement of the therapeutic action.

PARPAM- NANO PARTICLE

Animal derivatives such as horns, shells, feathers, metallic and nonmetallic minerals are normally administered as parpam. Parpam means an ash obtained through incineration. the starter material undergoes an elaborate process of purification followed by the reaction phase, which involves incorporation of some other mineral and herbal extracts. Then the material in pellet form is incinerated in a furnace.

For the complete transformation of the material into the parpam state, the process of grinding, drying, and calcification may have to be repeated several times or atleast as many times as directed in the recipe. However the calcination is repeated until a satisfactory product is obtained. But in those instances where the number of calcinations is definitely indicated the process should be repeated accordingly, even if a satisfactory parpam is obtained within a few calcifications.

While preparing the parpams of lead, tin, and zinc, the number of dung cakes used as fuel, should always be comparatively lesser than the number used for other metals, because excessive heating will result in the reversion of the parpam to the metallic state.

PHYSICAL CHARACTERS

COLOR

A specific color is mentioned for each parpam. They are generally white and pale. The color of the preparation primarily depends on the parent material.

LUSTERLESS

Parpam must be lusterless before therapeutic application. For this test, parpam is observed under bright sunlight whether luster is present are not, if luster is still present it indicates further incineration.

LIGHTNESS AND FINENESS

Parpam floats on stagnant water surface. This test is based on law of surface tension. Properly incinerated parpam need to float on water surface.

TACTILE SENSATION

Tactile sensation can be absorbed and assimilated in the body without producing any irritation to mucous membrane of gastro intestinal tract.

PARTICLE SIZE

Prepared parpam should be in powder form. Particle of parpam should be like pollen grains of pondanus odoratissimus flower.

Physiologically, the particle fineness is of great importance. Most compounds of metals and minerals are not absorbed by the body from the digestive tract, because under ordinary circumstances, these substances could not be reacted upon by the secretions of the digestive system, so as to render them absorbable by the organism. This difficulty is overcome when the individual particles of these compounds are very minute. This concurrently has a say in the matter of dosage in that the dose could be reduced to a great degree as a major part of the finely particulate drug is absorbed into the system.

QUALITY CONTROL OF PARPAM

Traditionally, the end points of incineration of a metal and its conversion to a parpam state are evaluated based on the following criteria.

- When a parpam is spread between the index finger and thumb and rubbed, it should be so fine as to get easily into the lines and crevices of the fingers and should not be washed out from the lines of the fingers.
- When a small quantity is spread on cold and still water, it should float on the surface.
- The parpam should not revert to the original state.
- Parpam should be tasteless.
- The parpam should not produce nausea when administration.
- The parpam if satisfactory completed, is irreversible to its metallic waste when heated with a mixture of cane jaggery, hemp powder, ghee and honey.

IMPORTANCE OF PARPAM

- ❖ Maintain optimum alkalinity for optimum health.
- ❖ Provide easily absorbed and usable calcium.
- ❖ Cleanse the kidneys, intestines and liver.
- ❖ Maintain stronger bones and healthier teeth.
- ❖ Alleviate insomnia, depression.
- ❖ Keeps rhythmic heart beating.
- ❖ Keeps arrhythmias and minerals balance.
- ❖ Help metabolize iron in body.
- ❖ Aid nervous system.
- ❖ Breakdown heavy metals and drug residues in body.
- ❖ Neutralize harmful acids that lead to illness.
- ❖ Achieve a healthy alkaline level by neutralizing acid.
- ❖ Protect body from free radical damage.

STORAGE OF PARPAM

- ✓ Parpams are usually stored in glass bottles.
- ✓ For smaller packing, vials of glass may be employed.
- ✓ It is highly desirable that these preparations be stored and retained in relevant labelled containers.
- ✓ They are said to retain their potency for 100 years, if properly stored.

SCIENTIFIC REVIEW

PHARMACOLOGICAL ASPECT

VENKARAM:

Anti inflammatory activity of kaara sooda sathu parpam[(1)]:

S. Sudha Revathy sudharsanam, et al..,studied the anti inflammatory activity of kaara sooda sathu parpam. In the carageenan induced paw edema technique the rats at the dosage of 500mg/kg p.o. of VSP and NK, significant ($p<0.001$) inhibition of inflammatory progression was observed than the control group. In the tail flick method vedikaara silasathu parpam and nerunjil kudineer at the dosage of 500mg/kg, increased the tail withdrawal time significantly ($p<0.001$) when compared to the control group; this study has established the significant anti inflammatory of VSP and NK.

Diuretic activity of Sarva Noi Linga Chenduram[(46)]:

Dr A. Punitha1*,et al., studied the diuretic activity of sarva noi linga chenduram. In our study also the urinary output was markedly decreased in lithiatic control rats on day 28, however in Sarva Noi Linga Chenduram and standard treated rats the urinary volumes were increased when compared to that of lithiatic Group. This suggested that Sarva Noi Linga Chenduram might have moderate diuretic effect. Following ethylene glycol administration the excretion of calcium, oxalate, phosphate and protein were found to be increased in lithiatic group while in standard, test groups these levels were significantly decreased ($P<0.01$).

Anti-Inflammatory activity of Two Siddha Formulations In Combination(VSP and NK)[(2)]:

B. Akila* et al.., studied the anti inflammatory activity of VSP and NK.In acute inflammation model the administration of VSP and NK at the dose of 500mg/kg/p.o showed significant reduction in the paw edema volume at 3rd and 4th hr as compared to the control group.

Clinical study of Siddha formulations in kalladaippu

Venkara parpam[6]

Nalinisofia. H, was conducted a clinical study of 30 renal calculi cases treated with 122 mg of venkara parpam with Raddish juice twice a day for 48 days. The stone was expelled in 3 cases. Calculi were completely dissolved in 12 patients. There is a significant difference between before and after treatment in the kidney stone size ($p<0.02$) and symptoms ($p<0.0001$)

Kalladaippu thool[6]

Nalinisofia. H, was conducted a clinical study of 30 renal calculi cases treated with 5gm of Kalladaippu thool with Raddish juice twice a day for 8 weeks. The stone was expelled in 4 cases. Reduction of stone size and number of stones were observed in 9 cases. The USG report revealed that there is no evidence of stone in 9 cases.

VEDIUPPU:

Anti-Inflammatory activity of Two Siddha Formulations In Combination(VSP and NK)[(2)]:

B. Akila*et al.., studied the anti inflammatory activity of VSP and NK. In acute inflammation model the administration of VSP and NK at the dose of 500mg/kg/p.o showed significant reduction in the paw edema volume at 3rd and 4th hr as compared to the control group.

Diuretic activity of Vediyuppu cheyaneer[(3)]:

Dr.V.Velpandian,et al., studied the diuretic activity of vediuppu with CMC . In this study the Vediyuppu cheyaneer with CMC was unable to produce significant actions in dose of 500 mg/kg but Vediyuppu cheyaneer with adjuvant lime showed significant increase in volume of urine and also urinary excretion of sodium, potassium and chloride. In general, Vediyuppu cheyaneer has shown diuretic activity ($p<0.01$) wherein significant increase in K+ but not in Na+ excretion when compared to control was observed.

***Vediuppu chunnam*[(6)]**

Dr.H.Nalini sofia, studied the antilithic effect of two siddha drugs aerva lanata and vediuppu chunnam. The efficacy of the two Siddha drugs, Aerva lanata and Vediuppu chunam as antilithic agents were studied in rats using 0.75% ethylene glycol in drinking water as a urolithic rat model. 650 mg – 1300 mg. Vediuppu chunnam (Sublimed form) along with Aereva lanata increases the urinary excretion of uric acid, calcium, oxalate, phosphorus and protein in hyperoxaluric rats and also decreases the magnesium excretion without adverse effects The drug increases the urine volume, thereby reducing the solubility product with respect to calcium oxalate and other crystallizing salts such as uric acid, which may induce epitaxial deposition of calcium oxalate.

KARPOORA SILASATHU:

Anti-Inflammatory activity of Two Siddha Formulations In Combination(VSP and NK)[(2)]:

B. Akila* et al.,studied the anti inflammatory activity of VSP and NK.In acute inflammation model the administration of VSP and NK at the dose of 500mg/kg/p.o showed significant reduction in the paw edema volume at 3rd and 4th hr as compared to the control group.

Diuretic activity of karpoora silasathu parpam[(47)]:

Mohamed Saleem Abdul Shukkoor, et al.., studied the diuretic activity of karpoora silasathu parpam. The diuretic activity was found to be significant ($P < 0.01$) at minimum dose of 200 mg/kg p.o. in rats and dose dependant up to 1000 mg/kg p.o. Furthermore, natriuretic effect was found to be significant ($P < 0.01$), while no significant change was observed on urinary potassium excretion. The present study justified the use of Karpura shilajit bhasma as a diuretic drug. The results of this study could be used as a model data in the standardization of Karpura shilajit bhasma.

Silasathu parpam[(6)]

Nalinisofia. H, was studied the diuretic and lithotriptic activity of silasathu parpam. Karpoora silasathu act as a diuretic and Lithotriptic agent and is mainly indicated in the management of Renal calculi, Burning micturition and anuria. Magnesium present in silasatthu parpam increases the solubility of calcium oxalate and inhibits the precipitation of both calcium phosphate and calcium oxalate.

clinical trial on Kalladaippu in Karpoora silasatthu parpam[(8)]:

Nalinisofia. H, et al..,was conducted an open clinical trial in NIS after obtaining approval of Intitutional Ethics Committee (IEC- NIS/IEC/2011/03/04), which revealed that the mean standard deviation of renal calculi at before and after treatment were 8.30±3.16 and 4.2±4.03 respectively which is statistically significant ($t=6.092$ $p<0.001$) and the mean standard deviation of clinical symptoms score at before and after treatment were 4.95±1.89 and 2.93±0.66 respectively which is highly significant ($t=7.5$ $p<0.0001$). This clinical study analyzed the prevalence of renal stone, various causes and risk factors associated with renal stone disease. The test drug karpoora silasathu parpam posses the

therapeutic effect on renal stone and it is a cost effective herbo mineral siddha formulation will be used in the treatment of early detected kidney stone >10mm without marked obstruction and could avoid surgical intervention.

PALAGARAI:

Anti urolithiatic activity of Kara sooda sathu parpam[(1)] :

S. Sudha Revathy*,et al..,was studied the anti urolithiatic activity. The anti urolithiatic activity was studied using the zinc disc implantation method in rat model. There was a significant reduction in the stone weight in both groups treated with the drug of curative regimen when compared with the curative control group. The anti urolithiatic activity by zinc implantation method revealed that the drug is effective both in preventive and curative aspects.

Anti oxidant activity of Palagarai Chunnam[(48)]:

S. Balamurugan1,et al..,were studied the Anti oxidant activity of Palagarai Chunnam.. The aim of the study to determine the antioxidant activity of the palagarai chunnam by using Nitric acid Radical scavenging assay, ABTS assay, DPPH assay. Based on the results obtained from the In-vitro anti-oxidant assay for the sample of PC it was concluded that the Herbo mineral formulation PC has promising anti-oxidant activity in the estimated assays.

PADIKAARAM:

Antimicrobial Activity of Padigalinga Chenduram[49]:

V.C. Jiji Mol*,et al..,was studied anti microbial activity in padigalinga chenduram. The findings reveal that, Siddha herbo-mineral drug - Padigalinga chenduram have antimicrobial potency against enteric bacterial pathogens and they can be used in the treatment of infectious diseases pertaining to Gastro intestinal tract. The data obtained in these studies justify and support the usage of this drug in case of diarrhoea and dysentery..

Antimicrobial activity of Dhasalavana dhravagam[50]:

M. Ramani*,et al.., was studied the antimicrobial activity of DLD. From the antimicrobial study it was concluded that DLD is highly sensitive against Klebsiella pneumonia, Salmonella typhimurium, Staphylococcus aureus, Bacillus subtilis indicating its promising antimicrobial potency against selective gram-positive and gram-negative organism .Further the test drug fails to prove its antimicrobial activity against Proteus vulgaris, Enterobacter aerogens, Escherichia coli and Pseudomonas aeruginosa.

Antioxidant Activity Of Dhasalavana Dhravagam[50]:

M. Ramani*,et al..,was studied the anti oxidant activity of DLD. From that study the investigation of DPPH radical scavenging assay of DLD it was concluded that the test drug has shown promising antioxidant activity ns exhibit significant percentage inhibition against DPPH radicals when compared to that of standard BHT. Hence by considering the potential of DLD in near future the Dhasalavana dhravagam may be explored for effective control and clinical management of several infectious and stress related disease in humans.

LEMON JUICE:

1.Diuretic And Antihypertention Activity[12]:

Yoji Kato, [1] et al.., studied the antihypertensive and diuretic activity of lemon juice. Lemon juice is known to lower the triglyceride level and is thus beneficial for individuals suffering from hypertension. Lemon juice also lowers cholesterol. It is a mild diuretic and hence drinking lemon juice regularly is advisable. Lemon juice is value hypertension and urinary diseases if used in the form of reconstituted lemon drink .

2.Antimicrobial and antioxidant efficacy of *Citrus limon*[13].

Ehigbai I. Oikeh, [1] et al..,studied the anti microbial and anti oxidant efficacy of citrus limon.

The aim of this study was therefore to screen the acetone and ethanol extracts of *C. limon* for its antioxidant potential and antimicrobial efficacy agents against a panel of microbes implicated in skin diseases. The highest antibacterial activity was obtained with the acetone extract of *C. limon* against *Enterococcus faecalis* and *Bacillus subtilis*, and the most susceptible bacteria based on the overall mean inhibition diameters were the gram-negative Salmonella typhimurium, *Shigella sonnei* and the gram-positive *E. faecalis* and *B. subtilis.* Both extracts were active against *Candida glabrata*. The DPPH scavenging activity of the acetone extract was not significantly different from those of vitamin C and rutin. Nitric oxide scavenging activity was lowest in the ethanol extract of *C. limon.* The reducing ability of both plant extracts was significantly lower than that of vitamin C and rutin. The fact that both extracts of *C. limon* exhibited a broad spectrum of antibacterial activity and comparable efficacy to the synthetic antioxidants highlights the medicinal value of *C. limon* as a potential source for drug development amidst the obvious dearth of effective and safe antibacterial drugs, and also validates the ethnotherapeutic claim of the plant.

5.ANALYTICAL STUDIES OF AARADHARA PARPAM

Analytical study of the prepared drug brings the validation to be used as a medicine by subjecting the drug to many analysis and determining its quality and effectiveness. Standardization includes many studies such as its organoleptic properties, physico chemical properties and to assess the active principles and elements present in the drug. Thus analytical study brings the efficacy and potency of the drug.

As per AYUSH protocol for analytical study, the following parameters were evaluated.

Organoleptic characters:

- Colour
- Odour
- Taste
- Texture

Physico chemical analysis:

- Determination of ash values
- Physical characterization

Chemical analysis:

Preliminary basic and acidic radical studies.

Elemental analysis:

- SEM and EDAX analysis
- FT-IR
- UV spectroscopy

5.1.ORGANOLEPTIC CHARACTERIZATION OF AARADHARA PARPAM

The organoleptic characters of the sample drug were evaluated. 1gm of the test drug was taken and the following characters were seen.

Colour, odour, taste, texture and other morphology were viewed by naked eye under sunlight, then the result was noted.

Colour:

The medicine was taken into watch glasses and placed against white background in white tube light. It was observed for its colour by naked eye.

Odour:

The medicine was smelled individually. The time interval among two smelling was kept 2 minutes to nullify the effect of previous smelling.

Results:

The results of organoleptic character were showed in table-3

5.2.THE PRELIMINARY PHYSICOCHEMICAL SCREENING TEST OF *AARADHARA PARPAM*

Physicochemical Properties of *Aaradhara parpam* was carried out for each mixture of *Aaradhara parpam* as per the standard procedure at The Tamil Nadu Dr. MGR Medical University, Anna Salai, Guindy, Chennai-600032.

Physico-chemical studies of the plant drugs are necessary for standardization, as it helps in under-standing the significance of physical and chemical properties of the substance being analyzed in terms of their observed activities and especially for the determination of their purity and quality. The analysis includes the determination of ash value, Loss on drying of the sample at 105ºC, pH value and Extractive value. These were carried out as per guidelines.

1. Loss On Drying:

An accurately weighed 2g of *Aaradhara parpam* formulation was taken in a tarred glass bottle. The crude drug was heated at 105ºC for 6 hours in an oven till a constant weight. The Percentage moisture content of the sample was calculated with reference to the

shade dried material.

2. Determination of total ash:

Weighed accurately 2g of *Aaradhara parpam* formulation was added in crucible at a temperature 600ºC in a muffle furnace till carbon free ash was obtained. It was calculated with reference to the air dried drug.

Calculation:

$$\text{Percentage of total ash} = \frac{\text{Weight of the ash}}{\text{Weight of test drug taken}} \times 100$$

3. Determination of acid insoluble ash:

Ash above obtained, was boiled for 5min with 25ml of 1M Hydrochloric acid and Filtered using an ash less filter paper. Insoluble matter retained on filter paper was washed with hot water and filter paper was burnt to a constant weight in a muffler

furnace. The percentage of acid insoluble as was calculated with reference to the air dried drug.

Calculation:

$$\text{Percentage of acid-insoluble ash} = \frac{\text{Weight of the acid-insoluble residue}}{\text{Weight of test drug taken}} \times 100$$

4. Determination of water soluble ash:

Total ash 1g was boiled for 5min with 25ml water and insoluble matter collected on an ash less filter paper was washed with hot water and ignited for 15min at a temperature not exceeding 450ºC in a muffle furnace. The amount of soluble ash is determined by drying the filtrate.

5. Determination of water soluble Extractive:

5gm of air dried drug, coarsely powered *Aaradhara parpam*was macerated with 100ml of distilled water in a closed flask for twenty-four hours shaking frequently. Solution was filtered and 25 ml of filtrated was evaporated in a tarred flat bottom shallow dish, further dried at 100ºC and weighted. The percentage of water soluble extractive was calculated with reference to the air dried drugs.

Calculation:

$$\text{Percentage of water soluble extract} = \frac{\text{Weight of the extract}}{\text{Weight of sample taken}} \times \frac{100}{25} \times 100$$

6. Determination of alcohol soluble extractive:

2.5gm. of air dried drugs; coarsely powdered *Aaradhara parpam* was macerated with 50 ml. alcohol in closed flask for 24 hrs. With frequent shaking it was filtered rapidly taking precaution against loss of alcohol. 10ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100ºC and weighted. The percentage of alcohol soluble extractive was calculated with reference to air dried drug.

Calculation:

$$\text{Percentage of alcohol soluble extract} = \frac{\text{Weight of the extract}}{\text{Weight of sample taken}} \times \frac{100}{25}$$

7. Determination of pH:

Five grams of *Aaradhara parpam* was weighed accurately and placed in clear 100 ml beaker. Then 50 ml of distilled water was added to it and dissolved well. After 30 minutes it was then applied in to pH meter at standard buffer solution of 4.0, 7.0, and 9.2. Repeated the test four times and average was recorded. The results were tabulated in Table –04

5.3. CHEMICAL ANALYSIS OF AARADHARA PARPAM

The chemical analysis of Aaradhara parpam was carried out in Bio chemistry lab, National Institute of Siddha, Tambaram sanatorium.

TABLE -1

EXPERIMENT	OBSERVATION	INFERENCE
Physical Appearance of extract	White in colour	
Test for Silicate A 500mg of the sample was shaken well with distilled water.	Sparingly soluble	Presence of Silicate
Action of Heat: A 500mg of the sample was taken in a dry test tube and heated gently at first and then strong.	No White fumes evolved.	Absence of Carbonate
Flame Test: A 500mg of the sample was made into a paste with Con. HCl in a watch glass and introduced into non-luminous part of the Bunsen flame.	No bluish green flame	Absence of copper
Ash Test: A filter paper was soaked into a mixture of extract and dil. cobalt nitrate solution and introduced into the Bunsen flame and ignited.	Appearance of yellow color flame	Absence of sodium

Preparation of Extract:

5gm of Aaradhara parpam was taken in a 250ml clean beaker and added with 50ml of distilled water. Then it was boiled well for about 10 minutes. Then it was cooled and filtered in a 100ml volumetric flask and made up to 100ml with distilled water. This preparation was used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.

TABLE -2

S.No	EXPERIMENT	OBSERVATION	INFERENCE
I . Test For Acid Radicals			
1.	**Test For Sulphate:** 2ml of the above prepared extract was taken in a test tube to this added 2ml of 4% dil ammonium oxalate solution	cloudy appearance	Presence of Sulphate
2.	**Test For Chloride:** 2ml of the above prepared extract is added with 2ml of dil-Hno3 until the effervescence ceases off. Then 2ml of silver nitrate solution is added.	Cloudy appearance was formed	presence of Chloride
3.	**Test For Phosphate:** 2ml of the extract is treated with 2ml of ammonium molybdate solution and 2ml of Con.HNo3	Cloudy yellow appearance present	Presence of Phosphate
4.	**Test For Carbonate:** 2ml of the extract was treated with 2ml dil. magnesium sulphate solution.	Cloudy appearance was evolved.	presence of carbonate
5.	**Test For Nitrate:** 1gm of the extract was heated with copper turnings and concentrated H2So4 and viewed the test tube vertically down.	No Brown gas was evolved	Absence of nitrate
6.	**Test For Sulphide:** 1gm of the extract was treated with 2ml of Con. HCL	No rotten egg smelling gas was evolved	Absence of Sulphide

	Test For Fluoride & Oxalate: **2ml of extract was added with 2ml of dil. Acetic acid and 2ml dil.calcium chloride solution and heated**.	**No cloudy appearance.**	**Absence of fluoride and oxalate**
II. Test For Basic Radicals			
	Test For Sodium: 2 pinches (50mg) of the extract was made into paste by using HCl and introduced into the blue flame of Bunsen burner.	No yellow colour flame evolved.	Absence of sodium
	Test For Mercury: 2ml of the extract was treated with 2ml of dil. sodium hydroxide solution.	No Yellow precipitate was obtained	Absence of Mercury
	Test For Arsenic: 2ml of the extract was treated with 2ml of dil. sodium hydroxide solution.	No Brownish red precipitate was obtained	Absence of arsenic
III. Miscellaneous			
	Test For Starch: 2ml of extract was treated with weak dil.Iodine solution	Blue colour developed	presence of starch
	Test For Reducing Sugar: 5ml of Benedict's qualitative solution was taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes. The	No Brick red colour is developed	Absence of reducing sugar

	Test For The Alkaloids: a) 2ml of the extract was treated with 2ml of dil.potassium lodide solution. b) 2ml of the extract was treated with 2ml of dil.picric acid. c) 2ml of the extract was treated with 2ml of dil.phosphotungstic acid.	Yellow colour developed White precipitate developed	Presence of Alkaloid
	Test For Tannic Acid: 2ml of extract was treated with 2ml of dil. ferric chloride solution	No Blue-black precipitate was obtained	Absence of Tannic acid
	Test For Unsaturated Compound: To the 2ml of extract, 2ml of dil. Potassium permanganate solution was added.	Potassium permanganate is not decolourised	Potassium permanganate is not decolourised
	Test For Amino Acid: 2 drops of the extract was placed on a filter paper and dried well. 20ml of Burette reagent was added**.**	No Violet colour appeared	No Violet colour appeared

	Test For Type of Compound: 2ml of the extract was treated with 2 ml of dil. ferric chloride solution.	No green and colour developed	Absence of quinolepinephrine pyrocatechoantipyrine
		Red colour developed	Aliphatic amino acid and meconic acid are present.
		No Violet colour developed	Apomorphine salicylate and Resorcinol were absent
		No Blue colour developed.	Morphine, Phenol cresol and hydrouinone were Absent.

The results were tabulated in table 5 & 5.1

INSTRUMENTAL ANALYSIS

5.4 FT-IR (Fourier Transform Infra-Red)

The fourier transform infrared spectroscopy test was carried out for Aaradhara parpam as per the standard procedure. The experimental procedure was done CECRI, karaikudi.

DEFINITION:

FTIR offers quantitative and qualitative analysis for organic and inorganic samples. Fourier Transform Infrared Spectroscopy (FTIR) identifies chemical bonds in a molecule by producing an infrared absorption spectrum. The spectra produce a profile of the sample, a distinctive molecular fingerprint that can be used to screen and scan samples for many different components. FTIR is an effective analytical instrument for detecting functional groups.

DESCRIPTION:

The perkin elmer spectrum FTIR instrument consists of globar and mercury vapour lamp as sources, an interferometer chamber comprising of KBr and mylar beam splitters followed by a sample chamber and detector. Entire region of 400-4500 cm-1 is covered by this instrument. The spectrometer works under purged conditions. Solid samples are dispersed in KBr or polyethylene pellets depending on the region of interest. This instrument has a typical resolution of 1.0cm -1cm. signal averaging, signal enhancement, base line correction and other spectral manipulations are possible.

The interference pattern obtained from a two beam interferometer as the path difference between the two beams is altered, when fourier transformed, gives rise to the spectrum. The transformation of the interferogram into spectrum is carried out mathematically with a dedicated on line computer.

APPLICATIONS : Quantitative Scans, Qualitative Scans x Solids, Liquids, Gases

- Organic Samples, Inorganic Samples
- Unknown Identification
- Impurities Screening
- Formulation
- Pharmaceuticals.

Fig :1.FTIR (Fourier Transform Infrared Spectroscopy)

INSTRUMENT DETAILS

Model	: Spectrum one: FT-IR Spectrometer
Scan Range	: MIR 450-4000 cm-1
Resolution	: 1.0 cm-1
Sample required	: 50 mg, solid or liquid.

Sample preparation:

Solid : KBr or nujol mull method

Liquid : cal / TIBr cells

Gas : Gas cells.

KBr method:

The sample was ground using an agate motor and pestle to give a very fine powder. The finely powder sample was mixed with about 100 mg dried potassium bromide salt. The mixture was then pressed under hydraulic press using a die to yield a transparent disc (measure about 13mm diameter and 0.3 mm in thickness) through which the beam of spectrometer passed.

Infrared spectrum is useful in identifying the functional groups like –OH, -CN, -NH2, etc. also quantitative estimation is possible in certain cases for chemical, pharmaceuticals, petroleum products etc. resins from industries, water and rubber samples can be analyzed. Blood and food materials can also be analyzed.

Measurements techniques:

The procedure for recording the %T or %A is as follows:

1.Air is first scanned for the reference and stored. The sample is then recorded and finally the ratio of the sample and reference data is computed to give required %T or %A at various frequencies.

2. Study of substances with strong absorbance bands and weak absorbance bands as well as possible.

3.Small amount of samples are sufficient.

4.High resolution is obtained.

Procedure:

Typically , 1.5 mg of protein , dissolved in the buffer used for its purification, were centrifuged in a 30K centric on micro concentrator (amicron) at 3000 g at 4^{o}c until a volume of approximately 40AI.

1. Then, 300AI of 20 Mm buffer, prepared in H_2O or $2H_2O$, PH or P_2H 7.2, were added and the sample concentrated again. The P_2H value corresponds to the PH.

2. Meter reading +0.4. the concentration and dilution procedure was repeated several times in order to completely replace the original buffer with the this buffer.

3. The washings took 24h, which is the time of contact of the protein with the 2 H_2O.

4. Medium prior FT-IR analysis, in the last washing, the protein was concentrated to fine a volume of approximately 40 AI and used for the infrared measurements.

5. The concentrated protein sample was placed in CaF2 windows and a 6 Am tin spacer or a 25Am Teflon spacer for the experiments in H_2O or 2 H_2O, respectively. FT-IR spectra were recorded by means of a perkin – elmer – spectrum – 1 FT-IR spectrometer using a deuterated triglycine sulfate detector.

6. Atleast 24 h before, and during data acquition, the spectrometer were continuosly purged with dry air at a dew point of 40ºc . spectra of buffers and samples were acquired at 2cm 1 resolution under the same scanning and temperature conditions. In the thermal denaturation experiments, the temperature was raised in 5ºc steps from 20 to 95ºc.

7. Before spectrum acquition, samples were maintained at the desired temperature for the time necessary for the stabilization of temperature inside the cell (6min). spectra were collected and processed using the spectrum software from perkin-elmer. Correct substraction of H_2O was judged to yield an approximately flat baseline at 1900-1400 cm-1, and substraction of 2 H_2O was adjusted to the removal of the 2 H_2O bending absorption close to 1220cm-1.

For scanning.

1.The sample is ground using an agate mortar and pestle to give a very fine powder.

2.The finely powder sample is then mixed with about 100mg dried KBr salt.

3.The mixture is then pressed under hydraulic press using a die to yield a transparent disc and measure about 13mm diameter and 0.3 mm in thickness.

Nujol mull method:

1.The sample is ground using an agate mortar and pestle to give a very fine powder.

2. A small amount is then mixed with nujol oil to give a paste and this paste is then applied between two sodium chloride plates.

3. The plates are then placed in the instrument sample holder ready for scanning.

Liquids:

1. Viscous liquids can be smeared in the cell and directly measured.
2. For dilute solutions, liquid cells and variable path length cells are employed.

Applications:

It is the preferred method of infrared spectroscopy. FT-IR is an important and more advanced technique. It is used to identify the functional group, to determine the quality and consistency of the sample material and can determine the amount of compounds present in the sample. It is an excellent tool for quantitative analysis.

In FT-IR infrared is passed from a source through a sample. This infrared is absorbed by the sample according to the chemical properties and some are transmitted. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular fingerprint of the sample. Like the finger print there is no two unique molecular structures producing the same infrared spectrum. It is recorded as the wavelength and the peaks seen in the spectrum indicates the amount of material present.

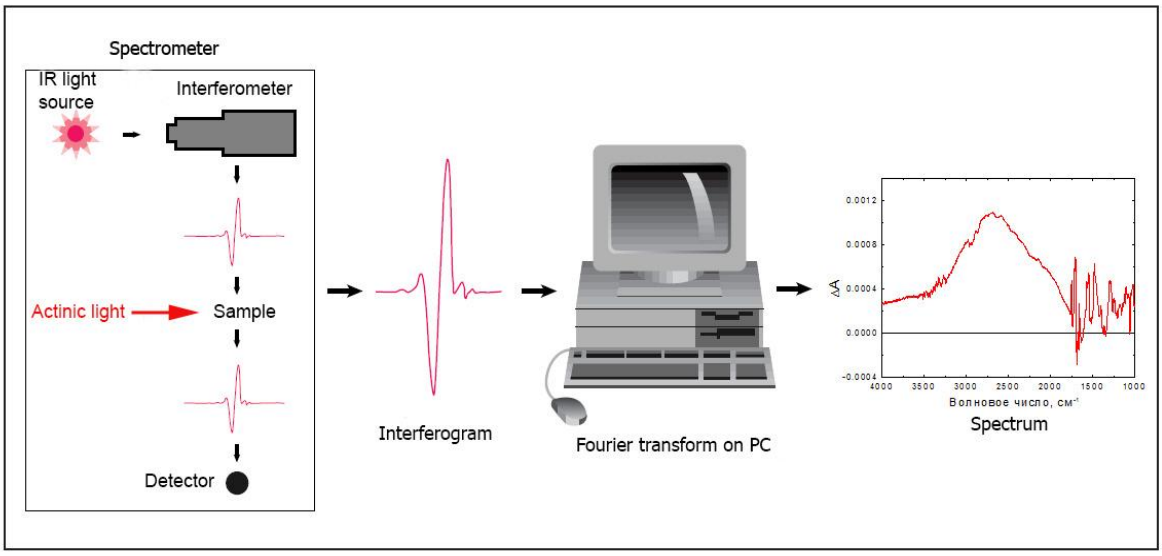
FT-IR is the most advanced and the major advantage is its

- Speed
- Sensitivity
- Mechanical Simplicity
- Internally Calibrated .

Analytical capabilities:

1. Identifies chemical bond functional groups by the absorption of infrared radiation which excites vibrational modes in the bond.
2. Especially capable of identifying the chemical bonds of organic materials.
3. Detects and identifies organic contaminants.
4. Identifies water, phosphates, sulphates, nitrates, nitrites, and ammonium ions.
5. Detection limits vary greatly , but are sometimes □ 10^{13} bonds/cm^3 or sometimes sub monolayer. Useful with solids, liquids, or gases.

Fig 2.FTIR (Fourier Transform Infrared Spectroscopy)



FTIR MECHANISM

Result:

The result of FTIR was represented in table no -6

5.5.SEM (SCANNING ELECTRON MICROSCOPE) :

The particle size of the *AARADHARA PARPAM* was determined using high resolution scanning electron microscopy (HR SEM). The experimental procedure was done at CECRI, Karaikudi.

DEFINITION

Scanning Electron Microscopy (SEM), also known as SEM analysis or SEM microscopy, is used very effectively in microanalysis and failure analysis of solid inorganic materials. The electrons interact with atoms in the sample, producing various signals that contain information about the samples surface topography and composition. The electron beam is scanned in a raster scan pattern, and the beams position is combined with the detected signal to produce an image. It is a powerful and mature technique in the examination of materials, widely in metallurgy, geology, biology and medicine.

Scanning electron microscopy is performed at high magnifications, generates high-resolution images and precisely measures very small features and objects.

FIG: 3 SEM INSTRUMENT

The quanta 200 FEG scanning electron microscope (SEM) is a versatile high resolution scanning electron microscope with three modes of operation namely,

1. High vaccum (HV) mode for metallic (electrically conducting) sample.
2. Low vaccum (LV) mode for insulating, ceramic, polymeric (electrically insulating)
3. Environment scanning electron microscope (ESEM) for biological samples.

Apart from giving the high resolution surface morphological images, the quanta 200 FEG also has the analytical capabilities such as detecting the presence of elements down to boron on any solid conducting materials through the energy dispersive x-ray spectrometry (EDAX) providing crystalline information from the few nanometer depth of the material surface via electron back scattered detection (BSD) system attached with microscope and advanced technological PBS (WDS) for elemental analysis. EDAX analysis is useful in the surface of the specimen. The EDAX analysis system works as an integrated feature of a scanning electron microscope (SEM) and cannot operate on its own without the latter.

Principle:

- The primary electron beam interacts with the sample in a number of key ways:
- Primary electrons generate low energy secondary electrons, which tend to emphasize the topographic nature of the specimen.
- Primary electrons can be back scattered which produces images with a high degree of atomic number (Z) contrast.
- Ionized atoms can relax by electron shell to shell transitions, which lead to either X- ray emission or auger electron ejection.
- The x-ray emitted are characteristic of the elements in the top fewμ m of the sample and are measured by the EDAX detector.

Method:

A representative portion of each sample was sprinkled on to a double side carbon tape and mounted on aluminium stubs, in order to get a higher quality secondary electron image for SEM examination.

Resolution:

1.2 nm gold particle separation on a carbon substrate

Magnification:

From a min of 12X to greater than 1,00,000 X.

Calculation of the particle size:

The horizontal line in the right corner of the micrograph corresponds to micro in length would be given. A comparison could be made between the length of the particles visible in the micrograph with this line and the length of the particles was calculated.

Procedure:

An electron beam passing through an evacuated column is focused by electromagnetic lenses onto the specimen surface. Since an electron is a charged particle. It has a strong interaction with the specimen (due to coulomb interaction). So when an electron beam images on a specimen, it is scattered by atomic layers near the surface of the specimen. As a result, the direction of electron motion changes and its energy is partially lost. Once an incident electron (primary electron) enters a substance, its direction of motion is influenced by various obstructions (multiple scattering), and follows a complicated trajectory which is far from a straight line. Also, when electrons with the same energy are incident on the specimen surface, a portion of electrons is reflected in the opposite direction (back scattered) and the remainder is absorbed by the specimen (exciting X-rays or other quanta in the process). If the specimen is sufficiently thin, the electron can pass all the way through the specimen (transmitted electrons , scattered or non scattered).

The depth at which various signals are generated due to electron beam- specimen interaction indicates the diffusion area of the signals in the specimen in addition to the local chemistry of the specimen. Secondary electrons mainly indicate information about the surface of a specimen. Since secondary electrons do not diffuse much inside the specimen, they are most suitable for observing the fie structures of the specimen surface. That is to say, sharp scanning images with high resolution can be expected from secondary electrons, because of the smaller influence on resolution by their diffusion.

As the incident electron energy increases , the probability of incident electrons colliding with elemental components of the specimen and releasing secondary electrons also increases. In other words, as the incident energy increases, the emission of electrons

from the specimen also increases. However, as the energy increases beyond a certain level, the incident electrons penetrate deeper into energy to reach the specimen with the result that the specimen derived electrons use up most of their energy to reach the specimen surface. Consequently, the electron emission yield decreases. Therefore, the peak secondary electron emission yield occurs at a specific entry level of the incident electrons.

In order to verify the existence of a substance and recognize its shape, the image contrast must be well defined. In other words, even if a system boasts extremely high resolution , if image contrast is poor, it would be extremely difficult to determine the existence of a substance, let alone recognize its shape, another important feature of the SEM is the three dimentional appearance of the specimen image, which is a direct result of the large depth of field.

Advantages of SEM:

1. It gives detailed 3D and topographical imaging and the versatile information garnered from different detectors.
2. This instrument works very fast.
3. Modern SEMs allow for the generation 0 data in digital form.
4. Most SEM samples require minimal preparation actions.

Disadvantages of SEM:

1. SEMs are expensive and large.
2. Special training is required to operate an SEM.
3. The preparation of samples can result in artifacts.
4. SEMs are limited to solid samples.
5. SEMs carry a small risk of radiation exposure associated with the electrons that scatter from beneath the sample surface.

SEM ANALYSIS APPLICATIONS

The signals generated during SEM analysis produce a two-dimensional image and reveal information about the sample including

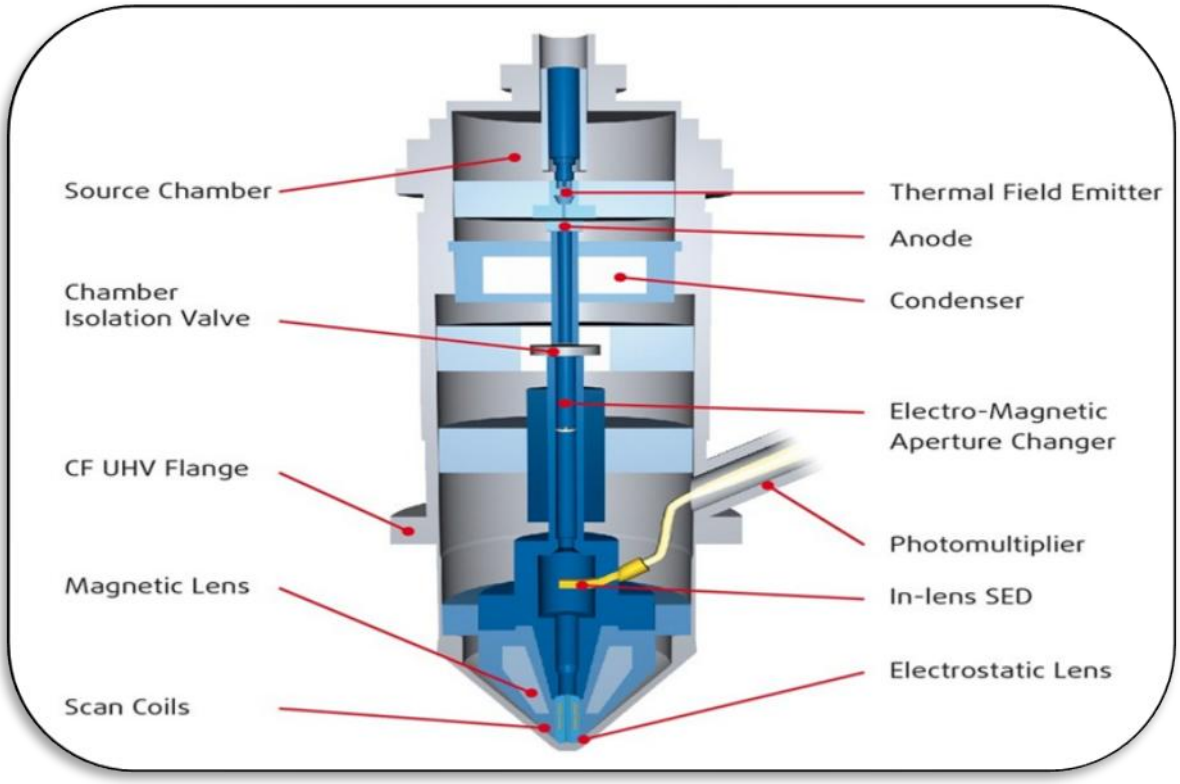
- External morphology (texture)
- Chemical composition (when used with EDS)
- Orientation of materials making up the sample
- The EDS component of the system is applied in conjunction with SEM analysis to:
- Determine elements in or on the surface of the sample for qualitative information
- Measure elemental composition for semi-quantitative results
- Identify foreign substances that are not organic in nature and coatings on metal
- SEM Analysis with EDS – qualitative and semi-quantitative results
- Magnification – from 5x to 300,000x
- Sample Size – up to 200 mm (7.87) in diameter and 80 mm (3.14) in height Materials analysed – solid inorganic materials including metals and minerals.

THE SEM ANALYSIS PROCESS

Scanning Electron Microscopy uses a focused beam of high-energy electrons to generate a variety of signals at the surface of solid specimens. In most SEM microscopy applications, data is collected over a selected area of the surface of the sample and a two-dimensional image is generated that displays spatial variations in properties including chemical characterization, texture and orientation of materials. The SEM is also capable of performing analyses of selected point locations on the sample. This approach is especially useful in qualitatively or semi-quantitatively determining chemical compositions, crystalline structure and crystal orientations.

The EDS detector separates the characteristic X-rays of different elements into an energy spectrum and EDS system software is used to analyse the energy spectrum in order to determine the abundance of specific elements. A typical EDS spectrum is portrayed as a plot of X-ray counts vs. energy (in keV). Energy peaks correspond to the various elements in the sample. Energy Dispersive X-ray Spectroscopy can be used to find the chemical composition of materials down to a spot size of a few microns and to create element composition maps over a much broader raster area. Together, these capabilities provide fundamental compositional information for a wide variety of materials, including polymers. In scanning electron microscope high energy electron beam is focused through a probe towards the sample material. Variety of signals was produced on interaction with the surface of the sample. This results in the emission of electrons or photons and it is collected by an appropriate detector.

Figure: 4



SEM MECHANISM

The types of signal produced by a scanning electron microscope include

- Secondary electrons
- back scattered electrons
- characteristic x-rays, light
- specimen current
- Transmitted electrons.

This gives the information about the sample and it includes external morphology, texture, its crystalline structure, chemical composition and it displays the shape of the sample.

EDAX: (Energy Dispersive X-Ray Analysis)

Energy Dispersive X-Ray Analysis is also known as EDS or EDX. It is an X-Ray technique used to detect the composition of elements present in the given material. It has its attachments to electron microscopy instruments like scanning electron microscopy

(SEM) or transmission electron microscopy (TEM) as the imaging competence of the microscope identifies the sample material.

Figure: 5 EDAX instrument

The data produced by the EDAX analysis consists of the spectra containing the elements present in the given sample which is being analysed. It is also possible to get the elemental mapping and image analysis of the sample.

EDAX technique is a non-destructive and can be qualitative, quantitative and provide spatial distribution of the elements.

Results:

The results were shown in the table no 7.

5.6.ULTRAVIOLET – VISIBLE SPECTROSCOPY:-

UV spectroscopy is an important tool in analytical chemistry. The other name of UV (Ultra violet) spectroscopy is Electronic spectroscopy as it involves the promotion of the electrons from the ground state to the higher energy or excited state.

Introduction to UV spectroscopy:-

UV spectroscopy is type of absorption spectroscopy in which light of ultra violet region (200-400nm) is absorbed by the molecule. Absorption of the ultra violet radiations results in the excitation of the electrons from the ground state to higher energy state.

Principle of UV spectroscopy:-

UV spectroscopy obeys the Beer-Lambert law, which states that: when a beam of monochromic light is passed through a solution of an absorbing substance, the rate of decrease of intensity of radiation with thickness of the absorbing solution is proportional to the incident radiation as well as the concentration of the solution.

Procedure:-

Monochromators generally composed of prisms an slits. The most of the spectrometers are double beam spectrophotometers. The radiation emitted from the primary source is dispersed with the help of rotating prisms. The various wave lengths of the light source which are separated by the prism are then selected by the slits such the rotation of the prism results in a series of continuously increasing wave length to pass through the slits for recording purpose. The beam selected by the slit is monochromatic and further divided into two beams with the help of another prisms.

Figure: 6 UV instrument

USES:

Identification of an unknown compound

An unknown compound can be identified with the help of UV spectroscopy. The spectrum of unknown compound is compared with the spectrum of a reference compound and if both the spectrums coincide then it confirms the identification of unknown substance.

Determination of the purity of a substance:

Purity of a substance can also be determined with the help of UV spectroscopy. The absorption of the sample solution is compared with the absorption of the reference solution. The intensity of the absorption can be used for the relative calculation of the purity of sample solution.

6. PHARMACOLOGICAL ACTIVITY

6.1. ANALGESICACTIVITY OF *AARADHARA PARPAM*

AIM:

To study the Analgesic activity of ***Aaradhara parpam*** in in Wistar albino mice by Eddy's Hot plate method

MATERIALS AND METHODS:

Test Substance	**:**	***Aaradhara parpam***
Animal Source	**:**	TANUVAS, Madhavaram, Chennai.
Animals	**:**	Wistar Albino mice (Male -12, female -12)
Age	**:**	6 - 8 weeks
Body Weight	**:**	25-30gm.
Acclimatization	**:**	14 days prior to dosing.
Veterinary examination	**:**	Prior and at the end of the acclimatization period.
Identification of animals	**:**	By cage number, animal number and individual Marking by using Picric acid.
Diet	**:**	Pellet feed
Water	**:**	Aqua guard portable water in polypropylene bottles.
Housing & Environment	**:**	The animals were housed in Polypropylene cages provided with bedding of husk.
Housing temperature	**:**	24-28°C
Relative humidity	**:**	between 30% and 70%,
Air changes	**:**	10 to 15 per hour
Dark and light cycle	**:**	12**:**12 hours.

Selection of animals:

Healthy Wistar albino mice (25-30g) of both sex were used for this study with the approval of the Institutional Animal Ethics Committee and obtained from the animal laboratory. IAEC approved no. NIS/IAEC-V/09082017/07

The animals kept in plastic cages and maintained at 24-28°C. All the rats were housed individually with free access to food, water and libitum.

They were feed with standard diet and kept in well ventilated animal house they also maintained with alternative dark-light cycle of 12hrs throughout the studies. Rats were allowed an acclimatization period of 14 days before actual experiments.

The rats were closely observed for any infection and if they show signs of infection they were excluded from the study. The animal experiment was performed with accordance legislation on welfare.

Grouping:

Group I	-	Ilaneer (10ml/kg)
Group II	-	Pentazocine (5mg/kg)
Group III	-	***Aaradhara parpam***(25mg/kg)
Group IV	-	***Aaradhara parpam*** (80mg/kg)

Procedure:

Animals were weighed and placed on the hot plate. Temperature of the hot plate was maintained at 55±1^{o}C. Responses such as jumping, withdrawal and licking of the paws were seen. The time period (latency period), from when the animals were placed and until the responses occurred, were recorded using a stopwatch. To avoid tissue damage of the animals 10 seconds was kept as a cut off time. The time obtained was considered the basal/normal reaction time in all the untreated groups of animals. Increase in the basal reaction time was the index of analgesia.

All the animals were screened initially at least three times in this way and the animals showing a large range of variation in the basal reaction time were excluded from the study. A final reading of the basal reaction time was recorded for the included animals. After selecting the animals, the drugs were administered to all the groups at the stipulated doses. The reaction times of the animals were then noted at 0, 30, 60, 90,120 and 150 min interval after drug administration.

Statistical analysis

Results were expressed as mean ± SEM and analyzed using Graph Pad Prism software. One way analysis of variance (ANOVA) test was applied P value ($P<0.05$) was considered as statistically significant. The results were tabulated in Table –9 and graph 2

6.2. ANTI-INFLAMMATORY ACTIVITY OF *AARADHARA PARPAM*

AIM:

To study the Anti-inflammatory effect of ***Aaradhara parpam*** in Wistar albino rats by Carrageenan-induced rat paw edema.

MATERIALS AND METHODS:

Test Substance	**:**	***Aaradhara parpam***
Animal Source	**:**	TANUVAS, Madhavaram, Chennai.
Animals	**:**	Wistar Albino Rats (Male -12, Female -12)
Age	**:**	6-8 weeks
Body Weight	**:**	140-160gm.
Acclimatization	**:**	14 days prior to dosing.
Veterinary examination	**:**	Prior and at the end of the acclimatization period.
Identification of animals	**:**	By cage number, animal number and individual marking by using Picric acid.
Diet	**:**	Pellet feed
Water	**:**	Aqua guard portable water in polypropylene bottles.
Housing & Environment	**:**	The animals were housed in Polypropylene cages provided with bedding of husk.
Housing temperature	**:**	24-28°C
Relative humidity	**:**	between 30% and 70%,
Air changes	**:**	10 to 15 per hour
Dark and light cycle	**:**	12**:**12 hours.

Selection of animals:

Healthy Wistar albino rats (140- 160g) of both sexes were used for this study with the approval of the Institutional Animal Ethics Committee and obtained from the animal laboratory. IAEC approved no: NIS/IAEC-V/09082017/07

The animals kept in plastic cages and maintained at 24-28°C. All the rats were housed individually with free access to food, water and libitum. They were feed with standard diet and kept in well ventilated animal house they also maintained with alternative dark-

light cycle of 12hrs throughout the studies. Rats were allowed an acclimatization period of 14 days before actual experiments.

The rats were closely observed for any infection and if they show signs of infection they were excluded from the study. The animal experiment was performed with accordance legislation on welfare.

The experimental protocol

Both sex of Adult wistar Albino rats weighing (140-160g) were used in this study. Rats were divided in to 4 groups, consisting six animals for each group.

Group I - Ilaneer(10ml/kg)

Group II - Indomethacin (10mg/kg)

Group III - ***Aaradhara parpam***(25mg/kg)

Group IV - ***Aaradhara parpam***(70mg/kg)

Acute inflammation was induced by carrageenan. Carrageenan was administrated by sub-planter injection of 0.1 ml freshly prepared 1% suspension in right hind paw in rats. The paw volume was measured initially and then 1,2,3,4 hr after the carrageenan injection by using plethysmoGraphic method.

Statistical analysis:

All the results were reported as mean + SEM. They were further analyzed using one way analysis of variables (ANOVA) followed by Tukey's multiple comparison test. The results were tabulated in Table –8 & graph 1

6.3. DIURETIC ACTIVITYOF *AARADHARA PARPAM*

AIM:

To study the diuretic effect of ***Aaradhara parpam*** in Wistar albino rats by lipschitz method.

MATERIALS AND METHODS:

Test Substance	**:**	***Aaradhara parpam***
Animal Source	**:**	TANUVAS, Madhavaram, Chennai.
Animals	**:**	Wistar Albino Rats (Male -12, Female -12)
Age	**:**	6-8 weeks
Body Weight	**:**	140-160gm.
Acclimatization	**:**	14 days prior to dosing.
Veterinary examination	**:**	Prior and at the end of the acclimatization period.
Identification of animals	**:**	By cage number, animal number and individual marking by using Picric acid.
Diet	**:**	Pellet feed
Water	**:**	Aqua guard portable water in polypropylene bottles.
Housing & Environment	**:**	The animals were housed in Polypropylene cages provided with bedding of husk.
Housing temperature	**:**	24-28°C
Relative humidity	**:**	between 30% and 70%,
Air changes	**:**	10 to 15 per hour
Dark and light cycle	**:**	12**:**12 hours.

Selection of animals:

Healthy Wistar albino rats (140- 160g) of both sexes were used for this study with the approval of the Institutional Animal Ethics Committee and obtained from the animal laboratory. IAEC approved no: NIS/IAEC-V/09082017/07

Adult Albino rats of either sex weighting 200 –220 g will be divided into five groups of six animals each. Prior to experimentation, Only the healthy animals were selected for the study. Before experimentation, the bladder of the rats will be emptied by gentle compression of the pelvic area and by the pull of their tails.

During the study, the animals will be placed in the metabolic cages (i.e. one animal per cage) to separate urine and faeces. The volume of urine will be collected in graduated vials will be measured at the end of 6 h and will be expressed as ml/100 g of body weight per 6 h. and the 6-hour urine will be analyzed by flame photometry for sodium and potassium and chloride by end point titration. To evaluate compounds with prolonged effects the 24 hour urine will be collected and analysed.

The experimental protocol

Both sex of Adult wistar Albino rats weighing (140-160g) were used in this study. Rats were divided in to 4 groups, consisting six animals for each group.

Group I - Ilaneer (10ml/kg)

Group II - Furosemide (20mg/kg)

Group III - *Aaradhara parpam* (25mg/kg)

Group IV - *Aaradhara parpam* (70mg/kg)

Procedure:

Adult Albino rats of either sex weighting 200 –220 g will be divided into five groups of six animals each. Prior to experimentation, Only the healthy animals were selected for the study. Before experimentation, the bladder of the rats will be emptied by gentle compression of the pelvic area and by the pull of their tails. Group I (control group) will be administered 10ml/kg of normal saline. Group II (Standard group) will be administered 25 mg/kg of furosemide and the test groups (III, and IV) will be administered different doses of test doses During the study, the animals will be placed in the metabolic cages (i.e. one animal per cage) to separate urine and faeces.

The volume of urine will be collected in graduated vials will be measured at the end of 6 h and will be expressed as ml/100 g of body weight per 6 h. and the 6-hour urine will be analyzed by flame photometry for sodium and potassium and chloride by end point titration. To evaluate compounds with prolonged effects the 24 hour urine will be collected and analysed.

Statistical analysis:

All values are expressed as mean values ± SEM (standard error of mean) and data were analysed by applying an analysis of variance (ANOVA) followed by dunnett□ s test. The result were considered statistically significant if p□ 0.05.

The results were tabulated in Table –10 &11 and graph 3& 4

RESULTS:

Many studies have been carried out to bring the efficacy and potency of the drug *AARADHARA PARPAM*. The study includes literary collections, organoleptic character, physicochemical analysis, FTIR, UV, SEM-EDAX, and pharmacological study. The drug ***AARADHARA PARPAM*** has been selected from the text ***"KANNUSAMY PARAMBARAI VAITHIYAM Page num-397".***

- Botanical aspect explains the active principle and medicinal uses of the plants.
- Gunapadam review brings the effectiveness of the drug in the management of renal calculi.
- The pharmacological review explains about the evaluation Of Anti inflammatory, Analgesic and Diuretic Activities.

Standardization of the test drug:

Traditional remedies is advantageous, it does suffer some limitations. The main limitation is the lack of standardization of raw materials, of processing methods and of the final products, dosage formulation, and the non- existence of criteria for quality control. Standardization of the drug brings the validation, to be used as a medicine, by subjecting the drug to many analysis and determining its quality and effectiveness.

Pharmacognostical standardization of herbal formulation is essential in order to assess the quality of drugs. Standardization of the drug is more essential to derive the efficacy, potency of the drug by analyzing it through various studies. Following tables and charts are the results of physicochemical and chemical analysis. Physical characterization and estimation of basic and acidic radicals have been done and tabulated. pharmacological activity of the drug were derived. Its result has been tabulated below.

ANALYTICAL STUDY OF AARADHARA PARPAM

1. ORGANOLEPTIC CHARACTER

Table: 3. Organoleptic characters of Aaradhara parpam

Colour	White
Odour	Odourless
Taste	Characteristic taste
Texture	Powder

2. PHYSICO-CHEMICAL ANALYSIS:

Table: 4. Physico-chemical properties of Aaradhara parpam

S.No	Parameters	Results
1	**LOD**	2.98%
	Ash value	
2	**a. Total ash (w/w)**	79.18%
	b. Acid insoluble ash (w/w)	76.32%
	c. Water Soluble ash (w/w)	15.06%
3	**Extractive values**	
	a. Alcohol successive soluble (w/v)	2.32%
	b. Water soluble extraction	29.52%
4	**PH**	8

INTERPRETATION

ASH:

Ash constitutes the inorganic residues obtained after complete combustion of a drug. Thus Ash value is a validity parameter describe and to assess the degree of purity of a given drug.

TOTAL ASH:

Total ash value of plant material indicated the amount of minerals and earthy materials present in the plant material. The total inorganic content (ammonium, potassium, calcium, chloride, iron, etc.,) present in the drug is measured through the Total ash value and it is of 79.18% for Aaradhara parpam

ACID INSOLUBLE ASH:

The acid insoluble ash value of the drug denotes the amount of siliceous matter present in the plant. The quality of the drug is better if the acid insoluble value is low. It is 76.32% for Aaradhara parpam

WATER SOLUBLE ASH:

Water-soluble ash is the part of the total ash content, which is soluble in water. It is 15.06%for Aaradhara parpam

EXTRACTIVE VALUES

- These are indicating the approximate measure of chemical constituents of crude drug.
- The percentage of soluble matters present in the drug is determined by the values of water extractive and ethanol extractive.
- Based on the extractive value suitable solvent can be selected. It also gives the percentage of drug which will correlate with the metabolism reactions.
- Water-soluble extractive value plays an important role in evaluation of crude drugs
- The alcohol-soluble extractive value was also indicative for the same purpose as the water-soluble extractive value

LOSS ON DRYING :

- The total of volatile content and moisture present in the drug was established in loss on drying.
- Moisture content of the drug reveals the stability and its shelf-life.
- High moisture content can adversely affect the active ingredient of the drug.
- Thus low moisture content could get maximum stability and better shelf life.

P_H:

- It is a measure of hydrogen ion concentration; it is the measure of the acidic or alkaline nature.7.0 is neutral, above 7.0 is alkaline and below is acidic.

The P_H of the drug Aaradhara parpam is 8.0 which is slightly alkaline in nature and it is essential for its bioavailability and effectiveness.

3. CHEMICAL ANALYSIS

The Chemical analysis shows the presence of silicate, chloride, Phosphate, sulphate, carbonate, Aluminium, Iron, Zinc, Calcium, Magnesium, Potassium, Starch, Alkaloids, antipyrine, meconic acid in Aaradhara parpam.

Table: 5. Chemical Analysis of *Aaradhara parpam*-Acid Radicals

S.NO	Parameters	Results
1.	**Silicate**	**present**
2.	**Sulphate**	**Present**
3.	**Chloride**	**present**
4.	**Phosphate**	**Present**
5.	**Carbonate**	**Present**
6.	**Nitrate**	Absent
7.	**Sulphide**	Absent
8.	**Oxalate**	Absent
9.	**Nitrite**	Absent
10.	**Borate**	Absent
11.	**Lead**	Absent
12.	**Copper**	Absent
13.	**Aluminium**	**Present**

INTERPRETATION :

The acidic radicals test shows the presence of **Silicate, Chloride, Phosphate, Sulphate, Carbonate and Aluminium.**

Table: 5.1 Chemical Analysis of Aaradhara parpam –Basic Radicals and Miscellaneous

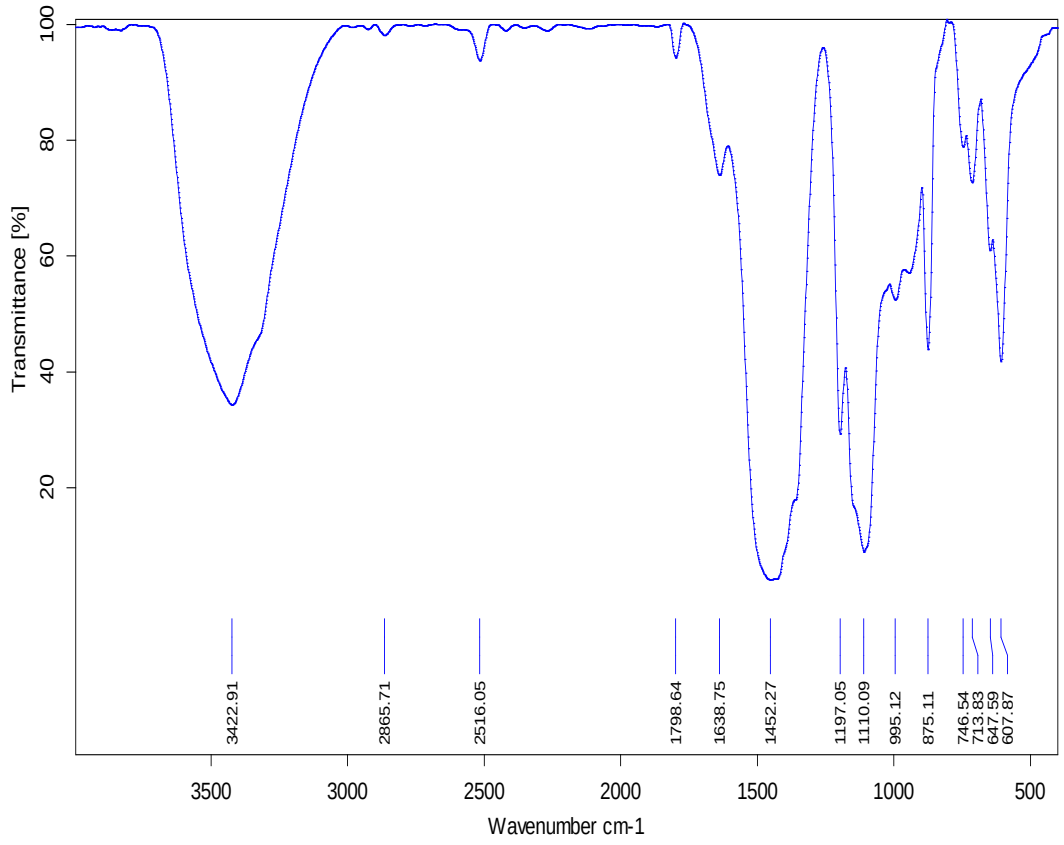
S.NO	Parameters	Results
14.	**Iron**	**Present**
15.	**Zinc**	**Present**
16.	**Calcium**	**Present**
17.	**Magnesium**	**Present**
18.	**Ammonium**	Absent
19.	**Potassium**	**Present**
20.	**Sodium**	Absent
21.	**Mercury**	Absent
22.	**Arsenic**	Absent
23.	**Starch**	**Present**
24.	**Reducing sugar**	Absent
25.	**Alkaloids**	**Present**
26.	**Tannic acid**	Absent

INTERPRETATION :

The basic radical test shows the presence of **Iron, Zinc, Calcium, Magnesium, Potassium, Starch, Alkaloids** and absence of heavy metals such as lead, arsenic and mercury.

4.FT-IR: (Fourier Transform Infra-Red)Spectroscopy

3462, 2865, 2516, 1798, 1638, 1452, 1197, 1110, 995, 875, 746,713, 647, 607.



E:\EXTERNAL\Chennai\Sample-1 11-02-19.0 Sample-1 11-02-19 Instrument type and / or accessory	13/11/2007

Page 1/1

Figure 7. FT-IR Spectrum of Aaradhara parpam

Interpretation (Table-6)

Wave number (cm-1)	**Vibrational modes of *Aaradhara Parpam* in IR region**	**Functional group**
3422	O–H stretch, H–bonded	alcohols, phenols
2865	C–H stretch	Alkanes
2516	O–H stretch	carboxylic acids
1798	C=O stretch	Acid Chlorides
1638	N–H bend	1˚ amines
1452	C–C stretch (in–ring)	Aromatics
1197	C–H stretch	alkyl halides
1110	C–N stretch	aliphatic amines
995	=C–H bend	Alkenes
875	=C–H bend	Alkenes
746	=C–H bend	Alkenes
713	N–H bend	1˚, 2˚ amines
647	C–Br stretch	alkyl halides
607	C–Br stretch	alkyl halides

In the FT-IR Spectra analysis, this Aaradhara Parpam sample exhibits the peak value shows in Table 1 at the wave number of 3422, 2865, 2516, 1798, 1638,1452, 1197,1110, 995, 875, 746, 713, 647, 607 having O-H Stretch , C–H stretch , O–H stretch , C=O Stretch, N-H Stretch, C–C stretch, C-H Stretch, C–N stretch , =C-H Bending , N–H bend, -C-H Bending, C-Br Stretch. This indicates the presence of some organic functional groups such as amine, alkanes, carboxylic acids, alkyl halides, alkenes.

5.SEM WITH EDAX:

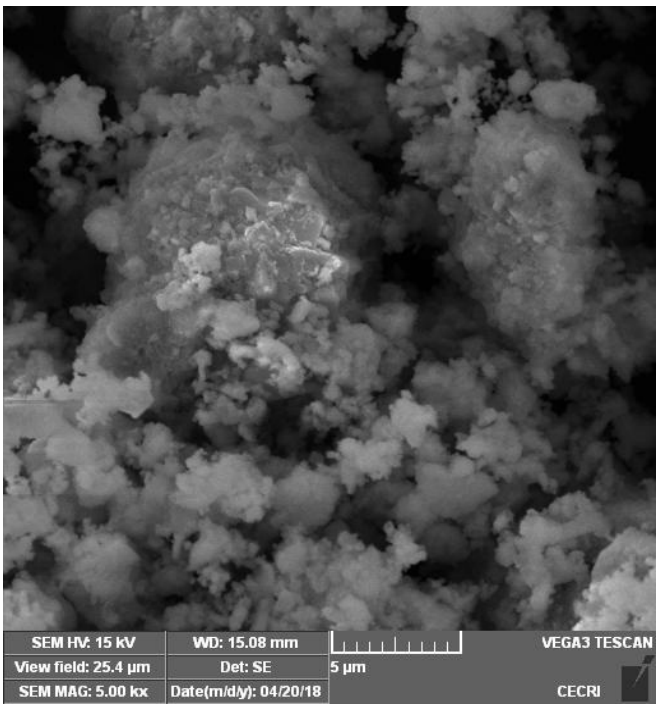


Fig 8:Showing SEM report of AP(5KX magnification)

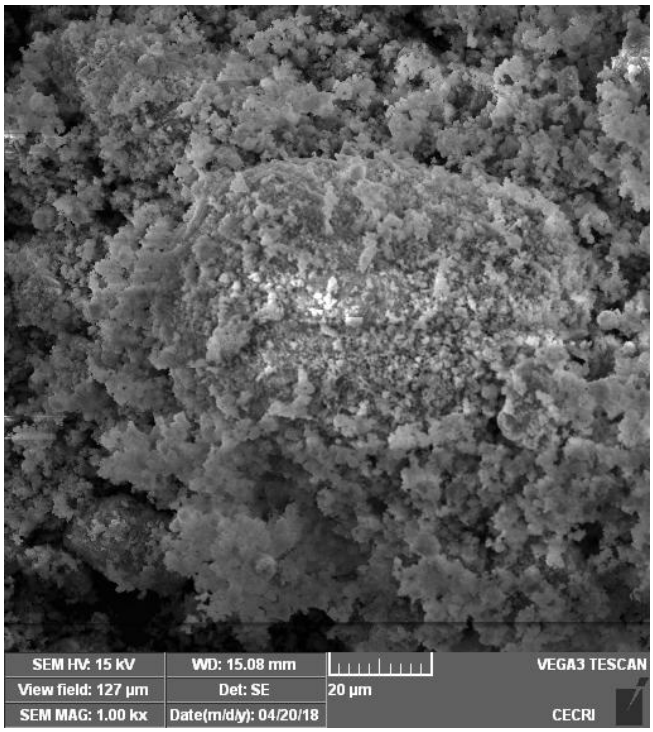


Fig 9:Showing SEM report of AP(1KX magnification)

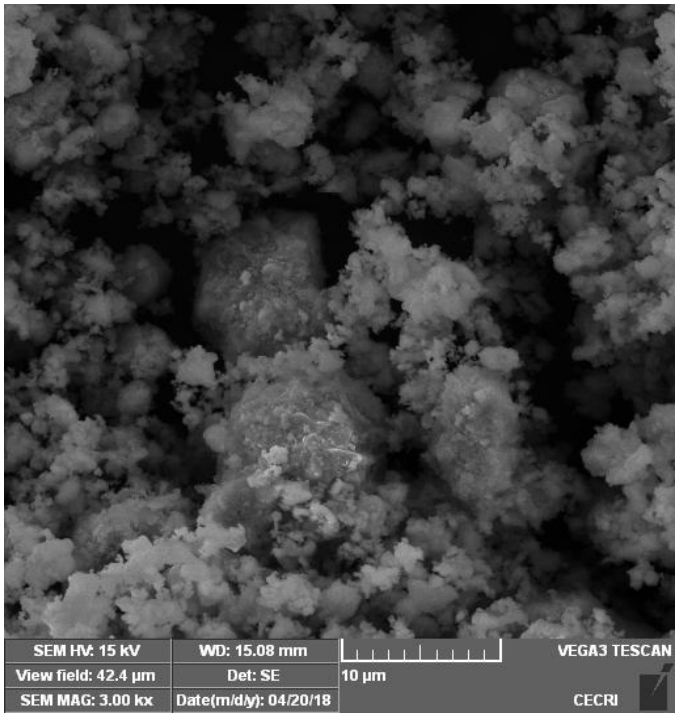


Fig 10:Showing SEM report of AP (3KX magnification)

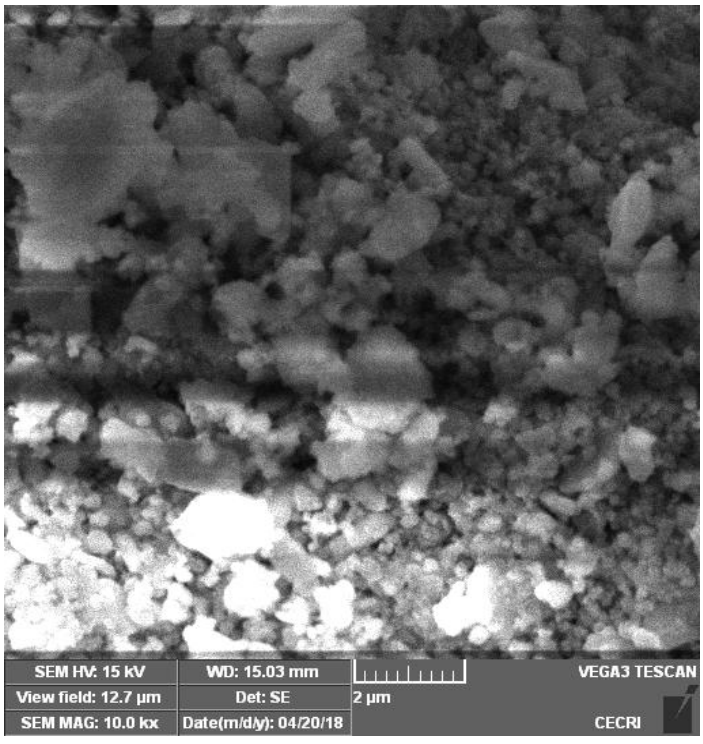


Fig 11: Showing SEM report of AP (10KX magnification)

EDAX:

Fig:12

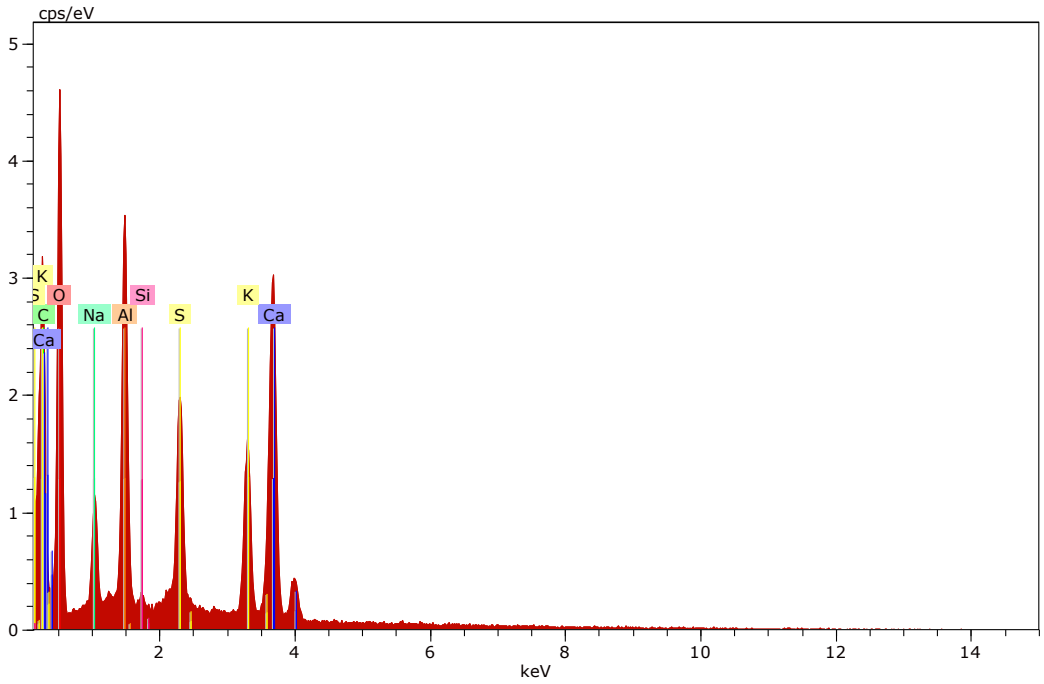


Table:7

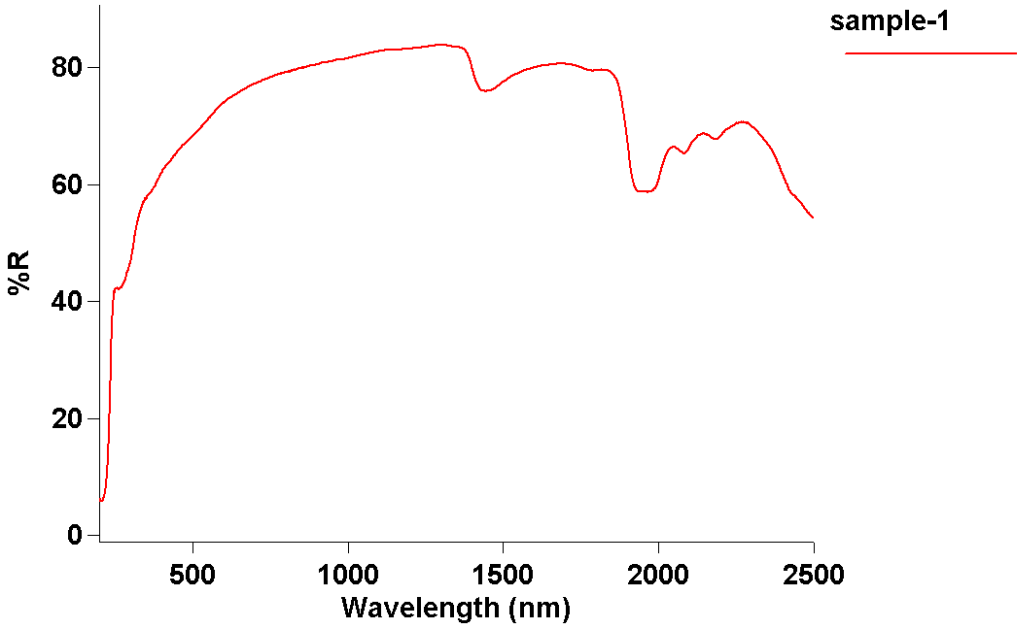
Spectrum: Acquisition 7577

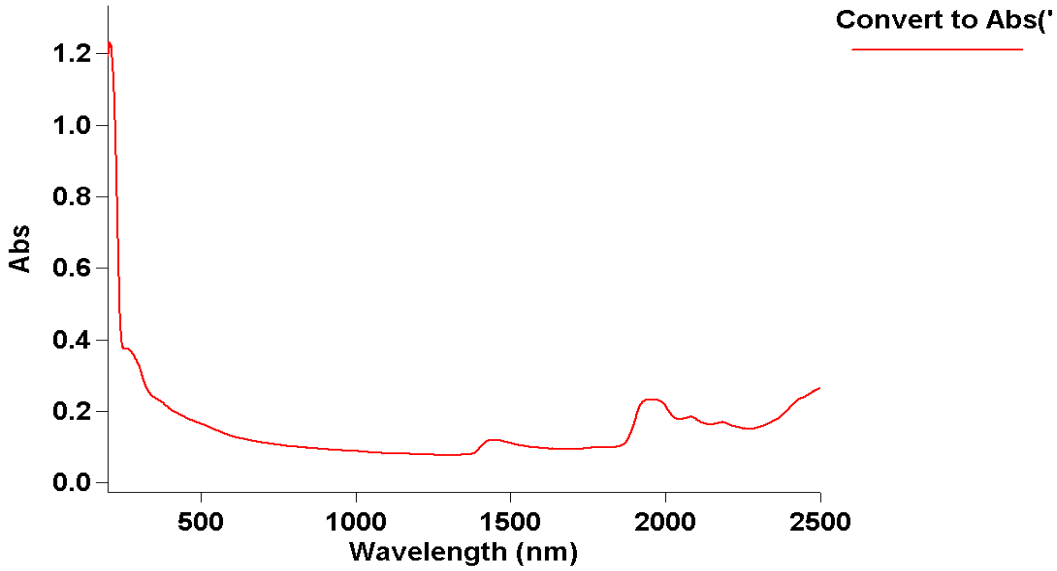
El	AN	Series	unn. C [wt.%]	norm.C [wt.%]	Atom.C [at.%]	Error (1 Sigma) [wt.%]	K fact.Z	corr.A	corr. F
O	8	K-series	37.52	51.67	66.16	4.81	0.649	0.796	1.000	1.000
Ca	20	K-series	13.47	18.56	9.49	0.44	0.081	2.270	1.000	1.012
Al	13	K-series	6.49	8.94	6.78	0.33	0.052	1.696	1.000	1.005
K	19	K-series	5.36	7.38	3.87	0.20	0.029	2.428	1.000	1.046
S	16	K-series	4.13	5.68	3.63	0.18	0.025	2.216	1.000	1.018
C	6	K-series	2.81	3.87	6.60	0.64	0.081	0.476	1.000	1.000
Na	11	K-series	2.79	3.85	3.43	0.21	0.028	1.347	1.000	1.003
Si	14	K-series	0.05	0.06	0.05	0.01	0.000	1.903	1.000	1.009

INTERPRETATION:

Energy dispersive x-ray analysis (EDAX) of AP was carried out and the elements present like, Oxygen, Aluminium, potassium, Sulphur and Calcium were estimated. From the spectra atom percentage of the elements are found to be as follows. Oxygen= 51.67%, calcium=18.56%, Aluminium=8.94%, potassium=7.38%, sulphur=5.68%. SEM and EDAX provide good estimate of the concentration of main elements in the drug. Furthermore, it provides useful information in the distribution of the elements forming the drug and their sample chemical form.

6. UV ULTRAVIOLET – VISIBLE SPECTROSCOPY:-



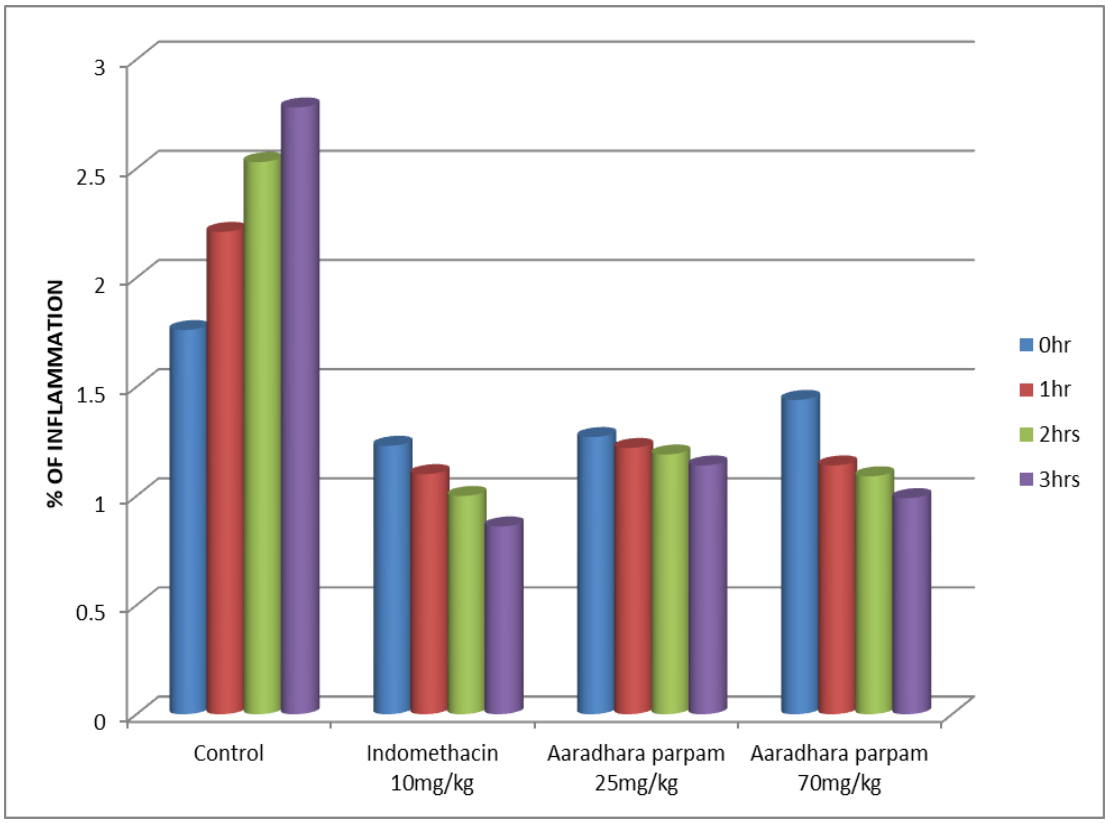


7. Anti inflammatory activity of Aaradhara parpam by carrageenan induced paw oedema in Wistar albino rats.

TABLE - 8

Treatment	percentage of inflammation after carrageenan injection at different hr			
	0hr	1hr	2hrs	3hrs
Control	1.76± 0.13	2.21±0.14	2.53±0.05	2.78±0.14
Indomethacin 10mg/kg	1.23±0.62	1.1±0.8	1.0±0.59	0.86±0.32**
Aaradhara parpam 25mg/kg	1.27±0.61	1.22±0.57	1.19±0.52	1.14±0.63 **
Aaradhara parpam 70mg/kg	1.44±0.64	1.14±0.77	1.09±0.65	0.99±0.50**

Values are Mean ± SEM; n = 6 animals in each group: * P<0.05, ** P< 0.01, ***P<0.001 is considered significant when compared with control rats and followed by one way ANOVA.



Graph - 2

Result of Anti inflammatory Activity:

Aaradhara parpam at 25 mg/kg dose showed significant anti inflammatory activity ($p<0.01$) at 3rd hour when compared to control group. At 70mg/kg the drug showed significant ($p<0.01$) at 3rd hour. Among the two doses of Aaradhara parpam,70mg/kg have shown better anti inflammatory activity($p<0.01$) when compared with control group.

Conclusion:

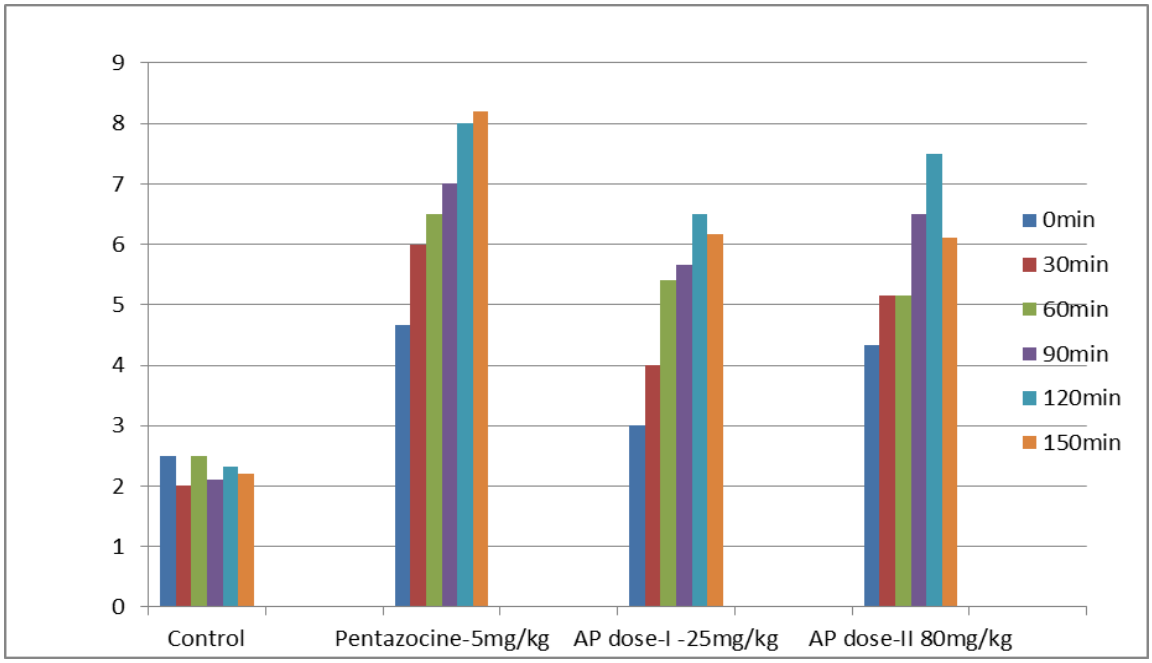
Thus it was concluded that administration of **Aaradhara parpam** the dose of 70mg/kg/ showed significant Anti inflammatory ($p<0.01$) activity when compare to the control group.

8.Analgesic activity of Aaradhara parpam by eddy's hot plate method in swiss albino mice.

TABLE - 9

G.No	Treament	Reaction time in sec					
		0min	**30min**	**60min**	**90min**	**120min**	**150min**
I	Control	2.5±0.54	2.0±0.51	2.5±0.54	2.1±0.75	2.33±1.03	2.2±0.61
II	Pentazocine (5mg/kg)	4.66±1.36	6±2.82	6.5±3.22	7±2.52	8±2.36**	8.2±2.25**
III	AP dose-I (25mg/kg)	3±0.78	4±1.28	5.4±1.30	5.66±1.42	6.5±2.58**	6.16±1.94**
IV	AP Dose-II 80mg/kg).	4.33±0.91	5.16±1.16	5.16±1.16	6.5±1.57	7.5±1.81**	6.1±1.48**

Values are Mean ± SEM; n = 6 animals in each group: * P<0.05, ** P< 0.01, ***P<0.001 is considered significant when compared with control mice. The results were analyzed by ANOVA followed by Dunnet's test.



Graph - 1

Discussion :

Aaradhara parpam at 25 mg/kg dose showed significant analgesic activity($p<0.01$) when compared to control group at 120min & 150 min. At 80mg/kg the drug shown significant activity ($p<0.01$) at 120 mins & 150 mins when compared to control group. Among the two doses of Aaradhara parpam, 80mg/kg at 150 mins have shown significant analgesic activity($p<0.01$) when compared with control group.

Result:

Aaradhara parpam at the dose of 80mg/kg showed significant Analgesic ($p<0.01$) activity when compared with control mice.

9. DIURETIC ACTIVITY OF AARADHARA PARPAM BY LIPSCHITZ METHOD IN WISTAR ALBINO RATS.

Effect of oral administration of Aaradhara parpam on urine volume		
Groups	**Urine volume(ml/100g/24hr)**	**Diuretic index(24hr interval)**
Control(normal saline)	**8.66±2.25**	**-**
Standard(Furosemide 20mg/kg)	**20.5±4.24*** **	**2.36**
Dose I (Aaradhara parpam 25mg/kg)	**14.66±3.50**	**1.69**
Dose II (Aaradhara parpam 70mg/kg)	**19.33±4.14*** **	**2.23**

TABLE -10

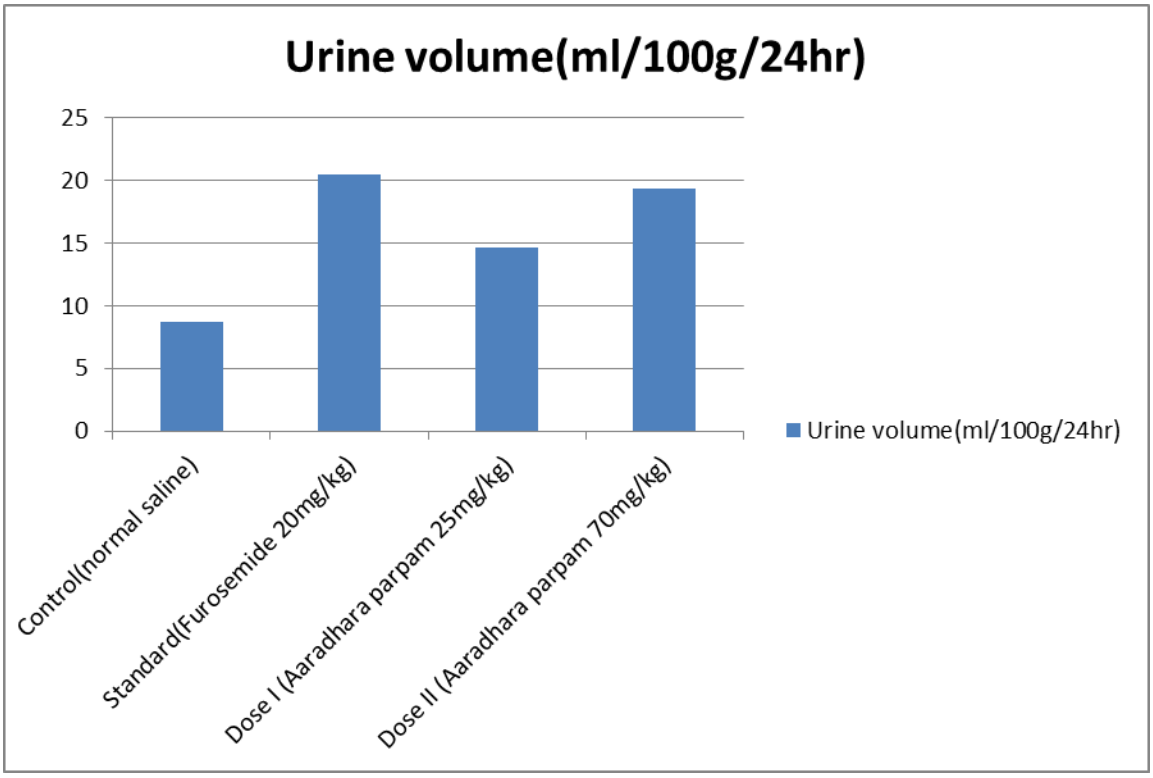
All values are expressed as mean ±S.E.M for six rats in each group. Comparisons made between control vs. treatment and treatment vs. standard ***p<0.001; **p<0.01;*p<0.05. [Diuretic index = volume of test group/volume of control group].

Effect on urine volume

There was no evidence of dehydration and the animals were found normal at the observed 5hr and 24hr intervals. As indicated in table no 10, The diuretic furosemide significantly increased the urine output when compared to control ($P < 0.001$) and the diuretic index being 2.36. The test drug at 25 and 70 mg/kg doses, showed a statistically significant increase in the volume of urine with a dose dependent increase in the diuretic index to 1.69 and 2.23 respectively.

Effect on urinary electrolyte excretion

As indicated in table no 11, the test drug, when compared to the control group, showed a significant increase in the excretion of potassium and chloride excretion in a dose dependent manner ($P <0.01$) and ($P<0.001$).

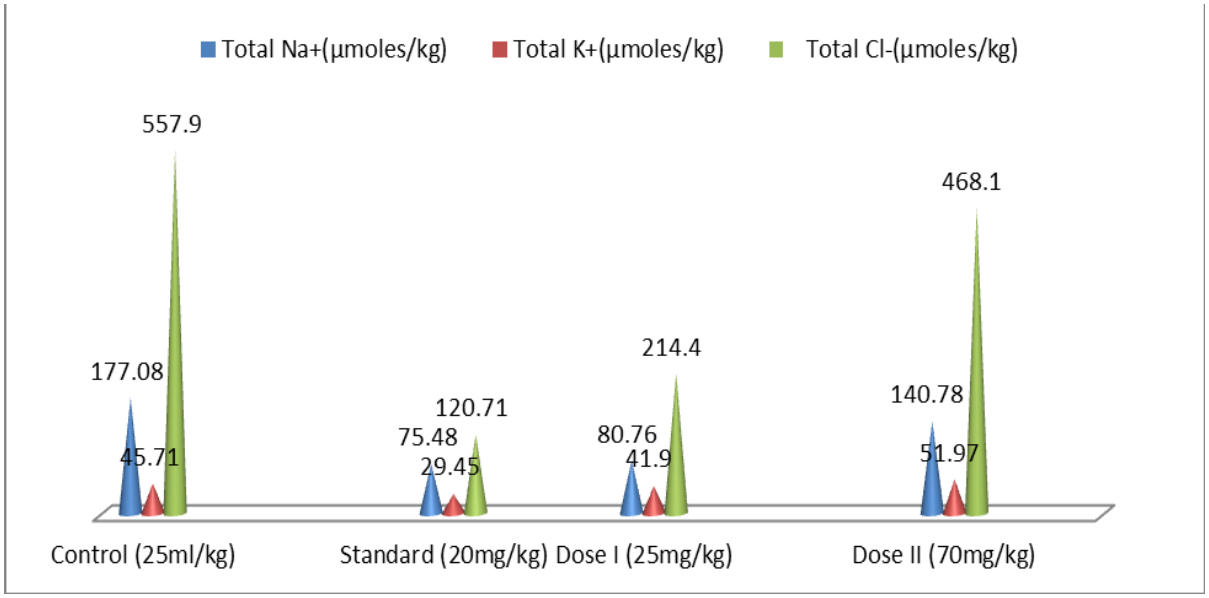

Urine volume(ml/100g/24hr)
25
20
15
10
5
0
Control(normal saline)
Standard(Furosemide 20mg/kg)
Dose I (Aaradhara parpam 25mg/kg)
Dose II (Aaradhara parpam 70mg/kg)
Urine volume(ml/100g/24hr)

Graph -3

9.1.Effect of oral administration of Aaradhara parpam on urinary electrolyte excretion in wistar albino rats

TABLE - 11

Effect of oral administration of Aaradhara parpam on urinary electrolyte excretion			
Treatment	**Total Na^+(µmoles/kg)**	**Total K^+(µmoles/kg)**	**Total Cl^- (µmoles/kg)**
Control (normal saline 25ml/kg)	**177.08±71.03**	**45.71±32.46**	**557.9±314.61**
Standard (Furosemide 20mg/kg)	**75.48±7.28**	**29.45±8.78**	**120.71±32.49**
Dose I (Aaradhara parpam 25mg/kg)	**80.76±8.78**	**41.9±19.09**	**214.4±167.47**
Dose II (Aaradhara parpam 70mg/kg)	**140.78±71.40****	**51.97±20.19****	**468.1±266.41*****



Graph 4

Observation and Inference:

All values are expressed as mean ±S.E.M for six rats in each group. Comparisons made between control vs. treatment and treatment vs. standard ***$p<0.001$; **$p<0.01$;*$p<0.05$.

Results expressed as mean ± S.E.M. Differences among data was determined using one-way ANOVA followed by Dunnett's test.

The AP has produced a dose dependant increase in total urine volume when compared to control. A highly significant ($p<0.001$) diuretic effect was observed at doses from 70 mg/kg. An increase ($p<0.001$) in urinary excretion of sodium, potassium and chloride was also observed at doses of 25 and 70 mg/kg in comparison to standard group..

The data in the table 10, allowed with the conclusion that the Aaradhara Parpam acts as a diuretic because of increased urinary electrolyte concentration with significant increase in the urinary output. The increase in the ratio of concentration of excreted sodium and Chloride ions for the test drug compared to standard group indicates that the Aaradhara Parpam increases chloride and sodium ion excretion to a greater extent than potassium which is essential quality of a good diuretic with lesser hyperkalaemic side effect.

Conclusion :

The present study revealed that the trial drug Aaradhara parpam possess significant diuretic activity at the dose levels of 25 and 70 mg/kg of body weight. The experimental evidence obtained in the laboratory model could provide a rationale for the traditional use of this trial drug as diuretic. These findings fairly supported the traditional claims of the trial drug Aaradhara parpam for the management of Neer adaippu, Neer erichal, Kalladaippu etc.

DISCUSSION:

The drug **Aaradhara parpam** was selected from the Siddha literature **"KANNUSAMY PARAMBARAI VAITHIYAM"** to validate the (Anti inflammatory, Analgesic and Diuretic activity) in an animal model.

The ingredients of the test drug was identified and authenticated by Siddha experts. The drug was prepared as per the procedure and subjected to various studies such as qualitative, quantitative, Standardization and pharmacological activities. Qualitative analysis includes Chemical analysis, Physicochemical properties of **Aaradhara parpam**. From the above analysis we came to know the presence of active ingredients responsible for its activity.

Literary collections:

Literary collections include drug review, which consist both Botanical aspect, Gunapadam aspect and pharmacological review are support this study.

Drug review:

Botanical aspect:

- Drug review about the ingredients of **Aaradhara parpam** from various text books was done.
- Botanical aspect explains the identification, description, active principle and medicinal uses of the plants. Siddha literatures related to the drug bring the evidence and importance of its utility in treating the renal calculi.

Gunapadam aspect

- Gunapadam review brings the effectiveness of the drug in treating renal calculi.

Pharmaceutical aspect

Pharmaceutical review describes about the parpam and its properties.

Pharmacological aspect

The pharmacological review explains about the methodology of anti inflammatory, analgesic and diuretic activity the drugs used and the analysis of pharmacological activity through carragennan induced paw edema method, Eddy's hot plate method and Lipschitz method. They explained about the effective analgesic, anti inflammatory and diuretic activity of Aaradhara parpam.

Physico chemical analysis

- In physico chemical analysis, the P_H of **Aaradhara parpam** was found to be in the range of 8.0.The P_H of the drug **Aaradhara parpam**is 8.0 which is slightly alkaline in nature and it is essential for its bioavailability and effectiveness.
- The loss on drying value at 105ºC of **Aaradhara parpam** was found to be 2.98%w/w, hence the drug will not lose much of its volume on exposure to the atmospheric air at room temperature. It shows that the drug has more stability.
- Ash value 79.18 % it is the residue remaining after incineration that determines the inorganic substances present in the drug. Similarly it can also detect the nature of the material, whether it is adulterate or not. Hence, determination of the ash value provides an idea for judging the identity and purity of the drug.
- Decreased water soluble ash value (15.06%) indicates easy facilitation of diffusion and osmosis mechanisms.

Chemical analysis:

Chemical analysis of the drug **Aaradhara parpam** revealed the presence of silicate, chloride, Phosphate, sulphate, carbonate, Aluminium, Iron, Zinc, Calcium, Magnesium, Potassium, Starch, Alkaloids, antipyrine, meconic acid in Aaradhara parpam.

Instrumental analysis

Based on the result **Aaradhara parpam** is preferably non –toxic to human in its therapeutic dose. The standardization of the drug was evaluated by chemical analysis characterization with elemental analysis, determination of particle size by FTIR and SEM-EDAX respectively.

FTIR

From the results, the N-H Stretch at 3422 indicates a strong peak of magnesium carbonate and potassium, the C-H Stretch at 2865 indicates pottasium, O–H stretch at 2516 indicates calcium carbonate and pottasium, N–H bend at 1638 indicates a potassium, C–N stretch at 1110 indicates a potassium phosphate, the =C-H Bending at 995, 875, 746 indicates a pottasium, N–H bend at 713 indicates a sodium, C–Br stretch at 647 indicates a strong bond of ammonium sulphate, C–Br stretch at 607

indicates a strong bond of ferrous sulphate . So, majorly this sample Aaradhara parpam contains potassium and calcium compounds where potassium is the dominant form here. Overall observation in the sample Aaradhara parpam is predominantly alkane in nature. From that, we can conclude it may neutralize the acids easily.

Also shows the presence of functional groups such as Alcohol, Amines, Acid, Alkanes, Alkyl Halide, acid chlorides and alkene groups. Major portions of potassium may use to prevent the formation of kidney stones. This FT-IR characterization results are creating the fingerprints to standardize this Siddha drug Aaradhara parpam.

SEM-EDAX

Energy dispersive x-ray analysis (EDAX) of AP was carried out and the elements present like, Oxygen, Aluminium, potassium, Sulphur and Calcium were estimated. From the spectra atom percentage of the elements are found to be as follows. Oxygen=51.67%, calcium=18.56%, Aluminium=8.94%, potassium=7.38%, sulphur=5.68%. SEM and EDAX provide good estimate of the concentration of main elements in the drug. Furthermore, it provides useful information in the distribution of the elements forming the drug and their sample chemical form.

Conclusion

The SEM photographs shows that the size of the particle is in nanometers which will promotes the easy or quick assimilation of the drug and thereby improving the efficacy. The EDAX result explores the active elements present in the drug like Oxygen, Calcium, Aluminium, Potassium, sulphur, which is necessary for its therapeutic effect against the diseases.

The elements such as sulphur and oxygen, detected in the drug are commonly present in all the herbal drugs originating from the primary metabolites.

Pharmacological studies:

The pharmacological study was carried out in the animal model Wistar albino rats and swiss albino mice.Three activities were seen in the drug of **Aaradhara parpam**. The activities were

- Anti Inflammatory
- Analgesic
- Diuretic

Anti Inflammatory Activity:

The anti-inflammatory activity was evaluated using carrageenan-induced paw edema models in Wistar albino rats.

Aaradhara parpam at 25 mg/kg dose showed significant anti inflammatory activity ($p<0.01$) at 3rd hour when compared to control group. At 70mg/kg the drug showed significant($p<0.01$) at 3rd hour. Among the two doses of Aaradhara parpam,70mg/kg have shown better anti inflammatory activity($p<0.01$) when compared with control group.

Analgesic Activity

swiss albino mice of either sex were divided into 4 groups of 6 animals each. Group I received vehicle control (Ilaneer), Group II received standard drug pentazocine (10mg/kg), Group III and Group IV received Aaradhara parpam at doses 25mg/kg and 80mg/kg respectively. From the results it was concluded that administration of Aaradhara parpam at the doses of 80mg/kg exhibited significant ($p<0.01$) analgesic activity in swiss albino mice when compared with control.

Diuretic activity:

Diuretic activity of Aaradhara parpam was carried out by lipschitz method in wistar albino rats with comparison of control group. The Aaradhara Parpam has produced a dose dependant increase in total urine volume when compared to control. A highly significant ($p<0.001$) diuretic effect was observed at doses from 70 mg/kg. The data in the table 10 & 11, allowed with the conclusion that the Aaradhara Parpam acts as a diuretic because of increased urinary electrolyte concentration with significant increase in the urinary output. The increase in the ratio of concentration of excreted sodium chloride and potassium ions for the test drug compared to standard. Aaradhara Parpam increases chloride and sodium ion excretion to a greater extent than potassium which is essential quality of a good diuretic with lesser hyperkalaemic side effect. Diuretic action of Aaradhara Parpam may be compared with the loop diuretics such as furosemide.

SUMMARY:

- The test drug **Aaradhara parpam** was selected from the siddha literature "Kannusamy parambarai vaithiyam page num-397" its *Standardization and Pharmacological screening* (Anti inflammatory, Analgesic and Diuretic activity) in an animal model. The dissertation started with an introduction explaining about the siddha concept and role of the test drug in treating renal disorders.

- The test drug was prepared properly by the given procedure. All the ingredients were identified and authenticated by the respective field experts.

- Review of literature in various categories was carried out. Siddha aspect, Botanical aspect and Pharmaceutical review disclosed about the drug and the disease. Pharmacological review was done to establish the methodologies.

- The drug was subjected to analysis such as, physicochemical, chemical analysis, Instrumental and pharmacological analysis which provided the key ingredients present in the drug thus it accounts the efficacy of the drug.

- Identification of functional groups was engaged by using Fourier Transform Infra Red spectroscopy [FTIR]

- The partical size and identification and quantitative analysis of chemical elements of **Aaradhara parpam** were assessed by SEM with EDAX

- The **Aaradhara parpam** does not show the evidence for the presence of any of the aflatoxins.

- The Instrumental analysis report reveals that the heavy metals like Lead, Cadmium Arsenic and Mercury are absent.

❖ Pharmacological study was done. It revealed the Anti-inflammatory, Analgesic and Diuretic activities of trail medicine in animal model viz., Wistar albino rats and swiss albino mice .This study suggests **Aaradhara parpam** has remarkable medicinal value in the treatment of renal calculi, urinary tract infections and other renal disorders.

❖ Results and discussion gives the necessary justifications to prove the potency of the drug.

❖ Conclusion gives a complied form of the study and explains the synergistic effect of all the key ingredients and activities that supports the study.

❖ Thus the herbo mineral formulation **Aaradhara parpam** is validated for its safety and efficacy for treating renal calculi and renal disorders it would be a great drug of choice.

CONCLUSION

From the literature evidence, Physico Chemical analysis, chemical analysis, Elemental analysis and Pharmacological studies, the author concludes that the drug **Aaradhara parpam** is safe and it has significant effect in Anti-inflammatory, Analgesic and Diuretic activities. It was concluded that the **Aaradhara parpam** can be used in treatment of renal disorders like Neer adaippu, Kalladaippu etc.. which is cost effective and easy to prepare.

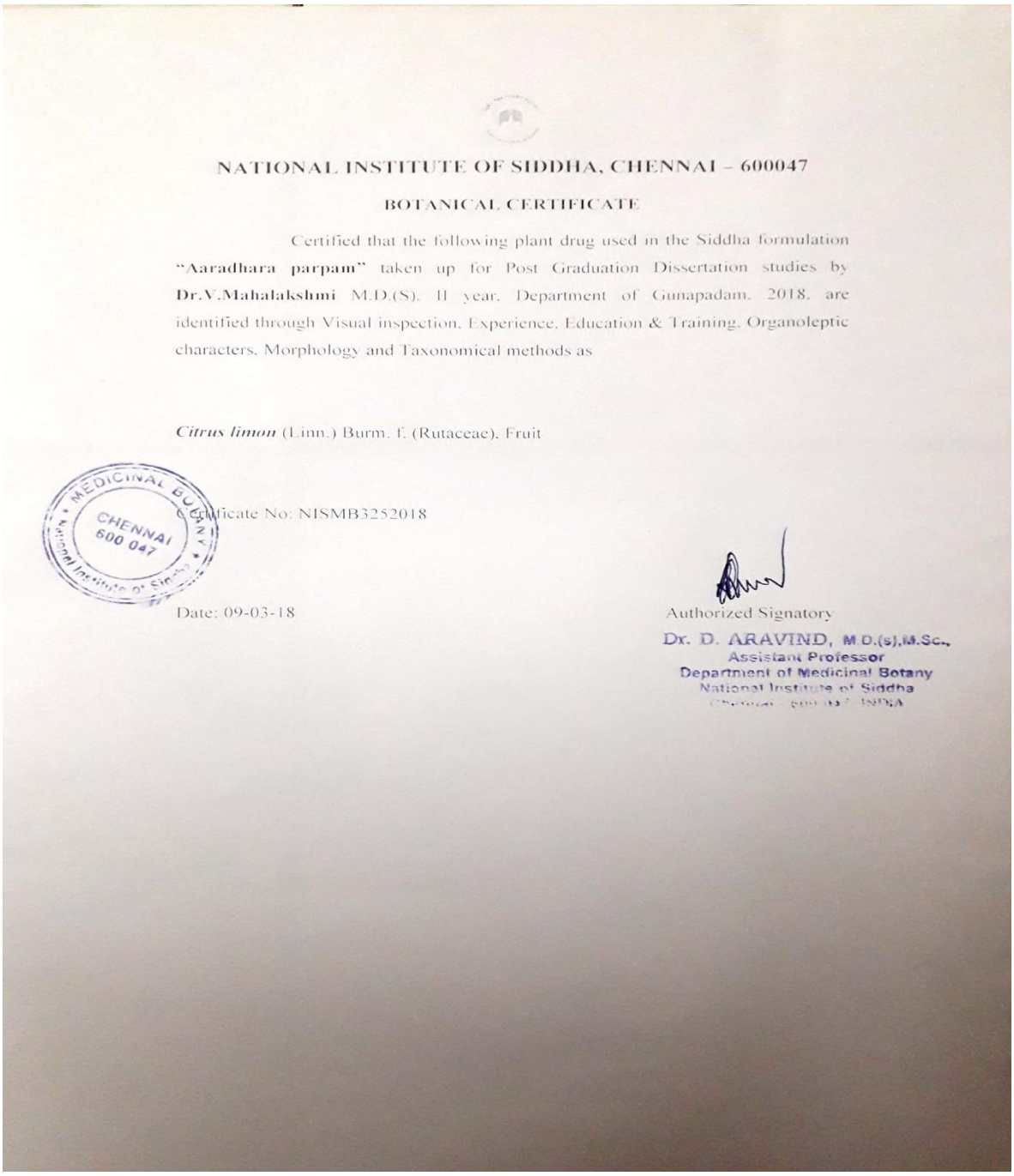
BIBLIOGRAPHY:

1) Sudharevathy sudharsanam , murugesan moonandi, Potency of kaara sooda sathu parpam a herbo mineral siddha drug in the management of kalladaippu noi - a drug review.
2) B. Akila* and K. Manickavasakam ,Anti - Inflammatory And Antinociceptive Activity Of Two Siddha Formulations In Combination
3) V.Velpandian1, S. S.Rajaprehidha V.Banumathi J. Anbu And AshwiniAnjana. Effect Of Vediyuppu Cheyaneer In Ethylene Glycol Induced Hyperoxaluria Model In Rats.
4) Sudharevathy sudharsanam , murugesan moonandi, Process standardization of kaara soda sathu parpam: a siddha herbo mineral drug.
5) S. Sudha Revathy1*, P. Suresh2, M. Murugesan3 and K. Manickavasagam4 Anti urolithiatic activity of a siddha herbomineral drug by zinc implantation method in experimental rats
6) Dr.H.Nalini sofia, Prevention And Management Of Kalladaippu (Urolithiasis) And Treatment Protocol
7) Muralidass S.D1*, Suganya R2, Hariharan S3, Vasudevan R1, Shree Devi M.SChemical Characterization Of Herbo - Mineral Siddha Formulation Kara Sooda Sathu Parpam By Using Modern Techniques
8) Efficacy Of Karpoora Silasatthu Parpam In The Management Of Azhal Kalladaippu (Renal Calculi). Nalinisofia. H1, Vetha merlin kumari.H2 Manickavasakam. K3 and Raja rajeswari4.
9) Mubarak.H, & G.masilamani, Siddha marine drug palagarai(cypraea moneta linn.)- a review.
10) R.Thiyagarajan, Siddha Maruthuvam Sirappu, Commisioarate of Indian Medicine and Homeopathy, Chennai, 3rd edition, 2008, Page no: 4
11) Cotran, Kumar, Robbin's, Pathologic Basis of Disease, printed in USA, 5th edition, 1994, Page no: 286.
12) Yoji Kato, [1] et al..,Effect on Blood Pressure of Daily Lemon Ingestion and Walking.
13) Ehigbai I. Oikeh,[1] Ehimwenma S. Omoregie, [1] Faith E. Oviasogie, [2] and Kelly Oriakhi [3] Phytochemical, antimicrobial, and antioxidant activities of different citrus juice concentrates.
14) O.I Oloyede, chemical constituents of cowry(cyparica samplomoneta), department of biochemistry, university of ado-ekiti, Nigeria, Pakistan journal of nutrition 7(4):540-542,2008 ISSN 1680-5194.

15) KD Tripathi, Essentials of Medical Pharmacology,7thedition,Jaypee Brothers, Page no:859
16) V.Narayanaswamy, Introduction to Siddha System of Medicine, Tamil Valarchi Kazhagam, first edition, 1975, Page no:68
17) V.Balaramiah, Greatness of Siddha Medicine, Saraswathy Sangam, Page no:19:
18) Veeramamunivarvagada page no 49
19) Dr.R.Thiyagarajan, Gunapadam thaathuseevam, 2nd Edition, Dept of Indian Medicine and Homeopathy, 2009, pg.56
20) S. KannusamyPillai, Sigitcha rathna Deepam, 1st Edition, B.Rathinanayagar & sons, 1991
21) Vaithiya sinthamani p 118
22) Murugesa Mudhaliyar, K.S. Gunapadam Mooligai Vaguppu– Indian Medicine and homeopathy Dept Chennai-106,7th edition, 2003
23) Dr. K.S. Krishnan Marg, The Wealth of India, Vol. VIII, Council of scientific and Industrial Research, New Delhi,2009,pg. 163-164.
24) Kritikar, K.R, Basu,B.D, Indian Medicinal Plants, vol II, 2nd Edition, International Book Distributors,Dehradun,1999,pg.1466.
25) Quality standard of indian medicinal plants vol II- ,Indian council of medical research new delhi 2005
26) Dr. K.S. Krishnan Marg, The Useful plants of India, National Institute of Science communication, New Delhi, 2000.
27) Kritikar, K.R, Basu, B.D, Indian Medicinal Plants, Vol I I 2nd Edition, International Book Distributors,Dehradun,2005,pg.1205,1206
28) Dr. K. M. Nadkarni, Indian Materia Medica, Vol I, Popular prakashan Pvt limited, pg. 153-155, 411-412,990-993,1119-1124,1229-1232.
29) Economic botany (1988) 42(3) 420-441 types of jiggery
30) Journals of ethnopharmacology 109(2007)226-228
31) Peiluo, yuen fan wong, Journal of pharmacology and experimental therapeutics dec2010,335(3)735-742 vol 365,issue 3
32) -Advances in pharmacology&toxicology.2014, vol 15 issue 1, p13-17
33) European journal of pharmaceutical and medical research ISSN 2394-3211
34) Formulary Of Siddha Medicine-IMPCOPS Chennai, IV, Edition,1993 (70-77.)
35) Quality Control Standards For Certain Siddha Formulations (CCRAS), Editon1991.

36) Kannusamypillai C, Sikitcha Rathna Deepam ennum vaidiya nool, Published by B.rathina Nayakker and sons,Vol 1, 3rd edition, 1991.
37) T.V.SambaSivam Pillai dictionary
38) (David jones, 2008)
39) Indian pharmacopoeia 2007 volume II page number 44- 47.
40) Quality control Methods for Medicinal Plant Materials, WHO Geneva, 1998, P.28-33
41) Hunton P Past President, World's Poultry Science Association Research on eggshell structure and quality: an historical overview.
42) Maxwell T. Hincke1, Yves Nys2, Joel Gautron2, Karlheinz Mann3, Alejandro B. Rodriguez-Navarro4, Marc D. McKee5 , The eggshell: structure, composition and mineralization.
43) T NakanoNI IkawaL Ozimek*Poultry Science*, Volume 82, Issue 3, March 2003, Pages 510–514, Chemical composition of chicken eggshell and shell membranes.
44) kanakavalli. k1*, chitra. u2, hemalatha. a3, thillaivanan. s4 .,Evaluation Of Diuretic Activity Of Siddha Drug Kungiliya Parpam (Kp) In Wistar Albino Rats.
45) GrasianImmanuel ,et al.., Antipyretic, wound healing and antimicrobial activity of processed shell of the marine mollusc *Cypraea moneta*.
46) Dr A. Punitha1*et al..,Effect of Sarva Noi Linga Chenduram for anti urolithiatic activity in ethylene glycol induced animal model.
47) Chemical and pharmacological evaluation of Karpura shilajit bhasma, an Ayurvedic diuretic formulation. African Journal of Traditional, Complementary and Alternative Medicines.
48) Anti oxidant activity of Siddha Herbo mineral formulation Palagarai Chunnam S. Balamurugan, G. Thanganila, V.Manjari, V. Banumathi
49) Antimicrobial Activity of Padigalinga Chenduram against Enteric Pathogens V.C. Jiji Mol*, S.Vasanth, P. Shanmugapriya, R.Madhavan, S.Murugesan, V.Manjari, M. Murugesan.
50) Antimicrobial and antioxidant evaluation of a retrospective siddha formulation Dhasalavana dhravagam used for the treatment of infectious disease .M. Ramani*, M. Pitchiahkumar, G. Dhanalakshmi, V. Velpandian and V. Banumathi

12.ANNEXURE:



NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drug used in the Siddha formulation **"Aaradhara parpam"** taken up for Post Graduation Dissertation studies by **Dr.V.Mahalakshmi** M.D.(S). II year, Department of Gunapadam, 2018, are identified through Visual inspection, Experience, Education & Training, Organoleptic characters, Morphology and Taxonomical methods as

Citrus limon (Linn.) Burm. f. (Rutaceae), Fruit

MEDICINAL BOTANY CHENNAI 600 047 National Institute of Siddha

Certificate No: NISMB3252018

Date: 09-03-18

Authorized Signatory

Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai-600 047. INDIA

NATIONAL INSTITUTE OF SIDDHA
MINISTRY OF AYUSH
GOVERNMENT OF INDIA
TAMBARAM SANATORIUM, CHENNAI - 600 047
Tele : 044-22411611 Fax : 22381314
nischennaisiddha@yahoo.co.in www.nischennai.org

07.02.2018

AUTHENTIFICATION CERTIFICATE

Certified that the samples submitted for identification by **Dr.V.Mahalakshmi, II** year PG scholar, Dept. of Gunapadam, National Institute of Siddha, Chennai - 47, are identified as **Vengaram-Borax , Vediuppu-Potassium nitrate , Padigaram -Alum, Silasathu-, Andaodu-Egg shell, Palagarai-Marine shell, Karsunnambu -Lime stone,** on the basis of macroscopic character.

This certificate is issued for the purpose of preparing her dissertation medicine in Gunapadam laboratory, NIS.

Dr. S. Visweswaran, M.D (s)
Head of Department
Department of Gunapadam
National Institute of Siddha
Tambaram Sanatorium, Chennai-47.

CERTIFICATE

Ministry of AYUSH

NATIONAL INSTITUTE OF SIDDHA

Ministry of AYUSH, Government of India

Tambaram Sanatorium, Chennai - 600 047.

WORKSHOP ON
RESEARCH METHODOLOGY & BIOSTATISTICS

This is to certify that

Dr. V. MAHALAKSHMI

has participated in the above Workshop held from 16.04.2018 to 20.04.2018 conducted by the Dept. of Noi Naadal, at National Institute of Siddha, Tambaram Sanatorium, Chennai-600 047.

Dr. G.J. Christian
Coordinator
HoD, Dept. of Noi Naadal,
National Institute of Siddha

Prof.Dr.V.Banumathi
Director,
National Institute of Siddha
Chennai – 600 047.

NATIONAL INSTITUTE OF SIDDHA

An Autonomous Body under Ministry of AYUSH
Govt. of India

Workshop on

Laboratory Animal Care and Basic Research Techniques

(12-16 February, 2018)

CERTIFICATE

This is to certify that Dr. V. MAHALAKSHMI has participated as Trainee / ~~Resource Person~~ / ~~organizing committee member~~ in the workshop on **"Laboratory Animal Care and Basic Research Techniques"** held on 12 - 16 February, 2018 at National Institute of Siddha, Chennai, Tamil Nadu.

Dr. V. Suba
Organizing Secretary

Prof.Dr.V.Banumathi
Director

CERTIFICATE

This is certify that the project title **Standardization and Pharmacological screening of *"Aaradhara parpam"*** has been approved by the IAEC. Animal Sanctioned: 24 Rats & 24 Mice
Approval No: NIS/IAEC-V/09082017/07 (Male or Female)

Prof.Dr.V.Banumathi
Chairman IAEC:

prof.Dr.K.Nachimuthu
CPCSEA nominee:

Signature with date

V. Banumathi 9/8/2017

Chairman/Member Secretary of IAEC:

CPCSEA nominee: 9/8/2017

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by Office)

Name of the principle investigator:

Dr.V.Mahalakshmi,
1st year pg scholar,
Department of Gunapadam,
National institute of siddha.

Name of the guide :

Dr.S.Visweswaran,MD(S)
Head of the department,
Department of Gunapadam,
National institute of siddha.

(6)

CERTIFICATE

This is certify that the project title **Standardization and Pharmacological screening of *"Aaradharaparpam"*** has been approved by the IAEC. Total No. of animals approved: 24 Rats (M/F)

Approval NO: NIS/IAEC-VII/280818/06

V. Banumathi

Prof.Dr.V.Banumathi
Chairman IAEC:

prof.Dr.K.Nachimuthu
CPCSEA nominee:

28/08/2018

Signature with date

Chairman/Member Secretary of IAEC:

CPCSEA nominee:

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by Office)

Name of the principle investigator:

Dr.V.Mahalakshmi,
2nd year pg scholar,
Department of Gunapadam,
National institute of siddha.

Name of the guide :

Dr.S.Visweswaran,MD(S),Ph.d
Head of the Department,
Department of Gunapadam,
National institute of siddha.

Received the original certificate.

V. Mahi
20/11/18
(Dr. V. MAHALAKSHMI)

ACKNOWLEDGEMENT

INTRODUCTION

AIM AND OBJECTIVES

REVIEW OF LITERATURE

MATERIALS AND METHODS

GUNAPADAM REVIEW

MINEROLOGICAL REVIEW

ZOOLOGICAL REVIEW

BOTANICAL REVIEW

SCIENTIFIC REVIEW

ANALYTICAL STUDY OF AARADHARA PARPAM

PHARMACEUTICAL REVIEW

ORGANOLEPTIC EVALUATIONS

PHYSICO CHEMICAL ANALYSIS

CHEMICAL ANALYSIS

FT-IR ANALYSIS

Ultraviolet – Visible Spectroscopy

SEM WITH EDAX ANALYSIS

PHARMACOLOGICAL STUDIES

CONCLUSION

BIBLIOGRAPHY

SUMMARY

RESULTS

DISCUSSION

BIBLIOGRAPHY

ANNEXURE